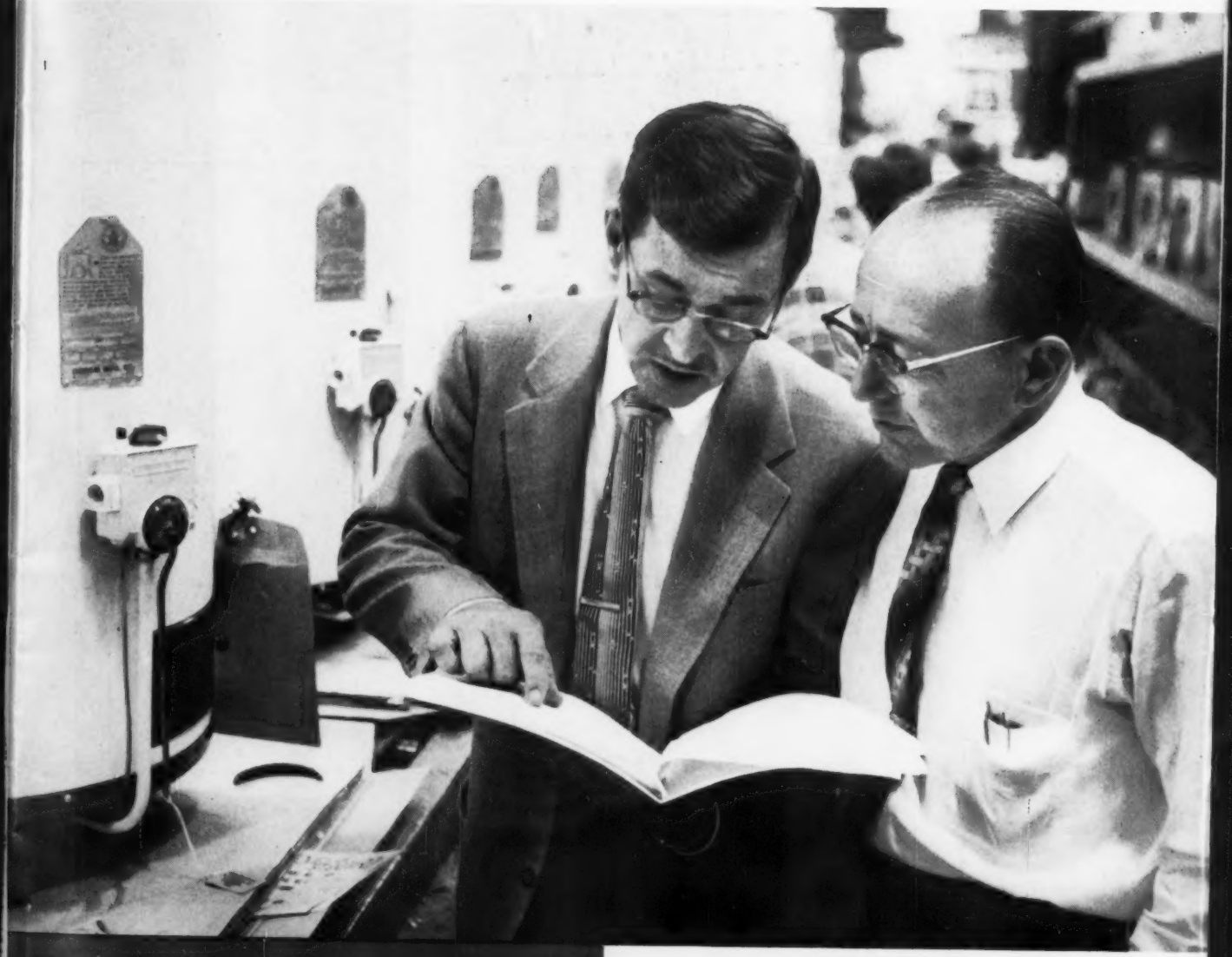
The IRON AGE

July 23, 1959 A Chilton Publication The National Metalworking Weekly



Rheem's Landis Points Out—

How to Take Quality Control Into the Field P. 37

Industry Turns Up New Uses for Magnesium – P. 27

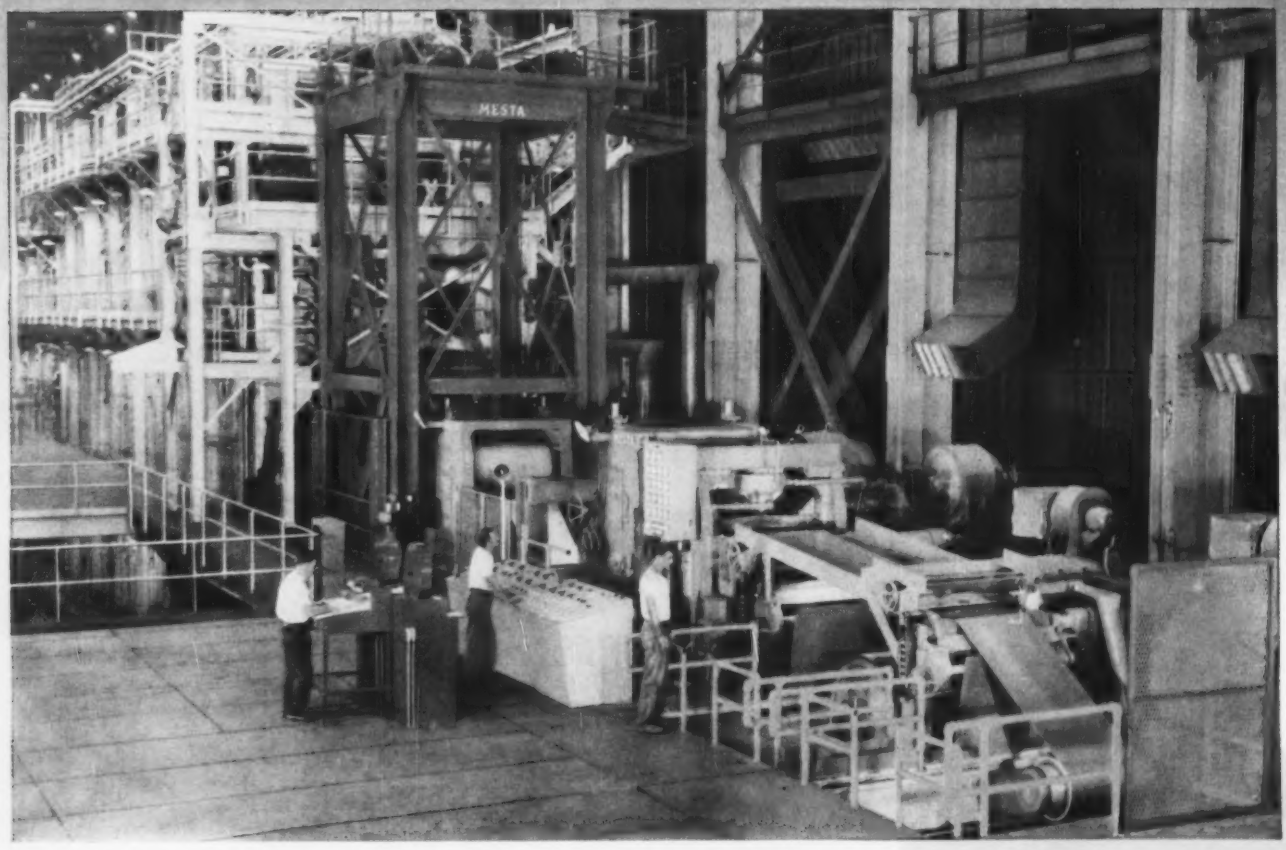
Low-Cost Maintenance For Hydraulic Systems – P. 63

Digest of the Week – P. 2-3

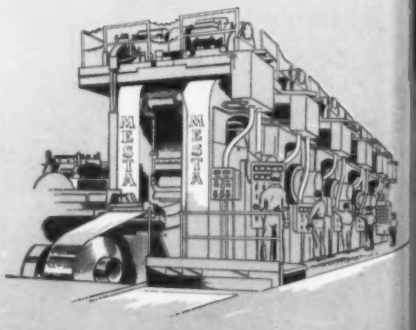
CLEANING AND ANNEALING LINES

Designed and Built by

MESTA



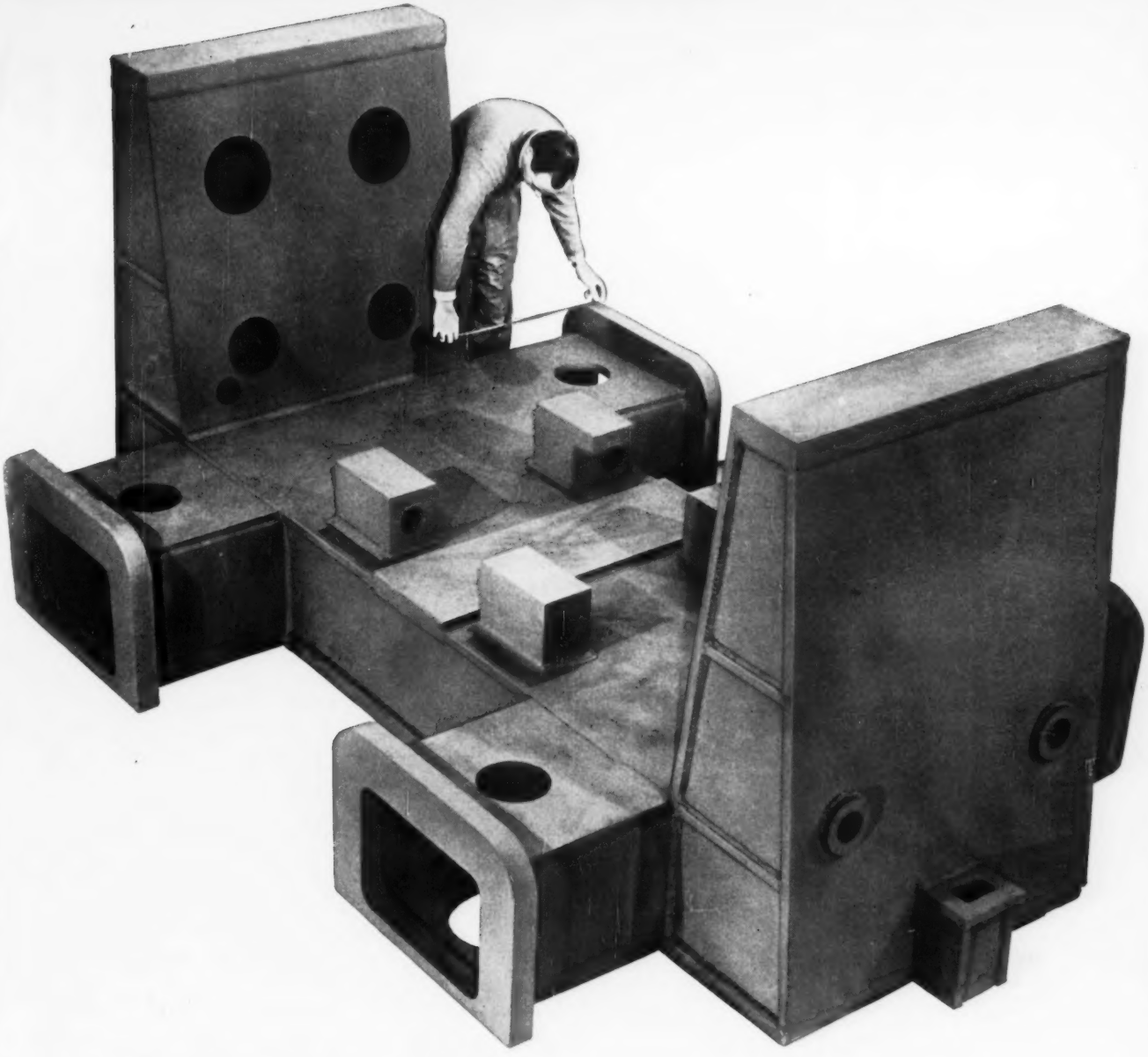
MESTA 2000 FPM Continuous Cleaning and Annealing Line for Steel Strip in Tin Plate Gauges with Pay-Off Reels, Mash Welder and Tension Reels in Operation at Weirton Steel Company, Division of National Steel Corporation.



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



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July 23, 1959—Vol. 184, No. 4

Digest of the Week in M

*Starred items are digested at right.

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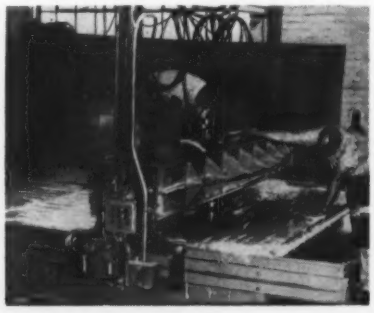
Who's Still Operating?—Here's a rundown of basic steel mills still operating despite the strike. They account for about 15 pct of the industry's ingot capacity. A breakdown by States. P. 100

Prospects for Settlement—This could be a long strike because the issues involved are so basic. Here is the story of what's being done to get it settled. Politics is involved, too. P. 102



MAGNESIUM MARKETS

Another Chance—Some fabricators are starting to look past the

Metalworking

ANALYZING FAILURES: Customer service reports can be some of the most valuable information coming into your company. Exponent of quality control in the field is Rheem Manufacturing's George Landis, left, conferring with inspector Joseph DeKlotz along assembly line. P. 37

price in considering magnesium. All the other factors seem to be dropping into line, and the metal is getting chances where it was once passed over. P. 27

REPORT TO MANAGEMENT

Business Near Peak?—The FRB Index of Production hit another new record in June and most indicators were still on the uptrend. P. 35

FEATURE ARTICLES

HYDRAULIC MAINTENANCE

A Simple Plan—Just taking care of early signs of trouble can produce big savings in hydraulic maintenance. That's the basis for a plan that requires no investment, just cooperation and a very little effort. By using ears, eyes and sense of touch, many hydraulic difficulties can be solved before a major breakdown occurs. P. 63

SHAPE LAMINATED PARTS

By Low-Cost Postforming—Certain laminate grades can be postformed. Once a few basic procedures are learned postforming can be adapted to good advantage wherever short production runs are used. P. 66

HONING BALL STUDS

With Precision Process — Two new special machines lick the old problem of producing precision ball-type parts. One unit turns the ball; the other finishes it. The setup applies better tooling geometry in solving the problem. P. 69

COIL PROCESSING

Use Proper Care—The way you maintain your coil processing equipment can spell the difference between major savings or none at all. Several basic rules can help in keeping proper care of system. P.72

COPPER ALLOY PARTS

Forge at Low Cost—Often the process that seems most costly at the outset will be cheapest in the long run. Here forgings produced savings in improving quality of copper alloy parts. P. 74

MARKETS & PRICES

LIGHTWEIGHT TRUCKS

Growing Trend — Fiberglass and aluminum are gaining prestige in the heavy-duty truck tractor field. Larger payloads, less maintenance are big selling points. Tooling costs are lower for builders. P. 41

IKE VERSUS INFLATION

Who Will Win?—The Cabinet and White House staff have their orders: Crusade against inflation. Congressmen report heavy mail in favor of holding down federal spending. P. 45

DEFENSE CONTRACTING

Big Business for Farwest—As the U. S. gets deeper into missile-making the West Coast's military backlog will grow. Five of the top ten defense contractors are based there. P. 47

BUILDING BLOCK TOOLS

Agreement Reached—In a history-making break with tradition, tool builders and users have agreed to standardize some machine tool components. It will mean more flexibility for automated setups. P. 49

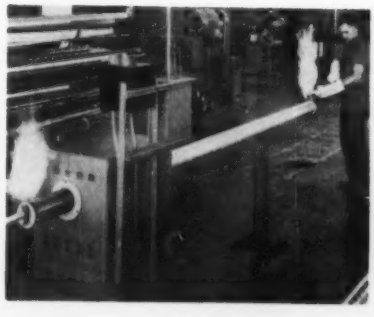
STEEL INVENTORIES

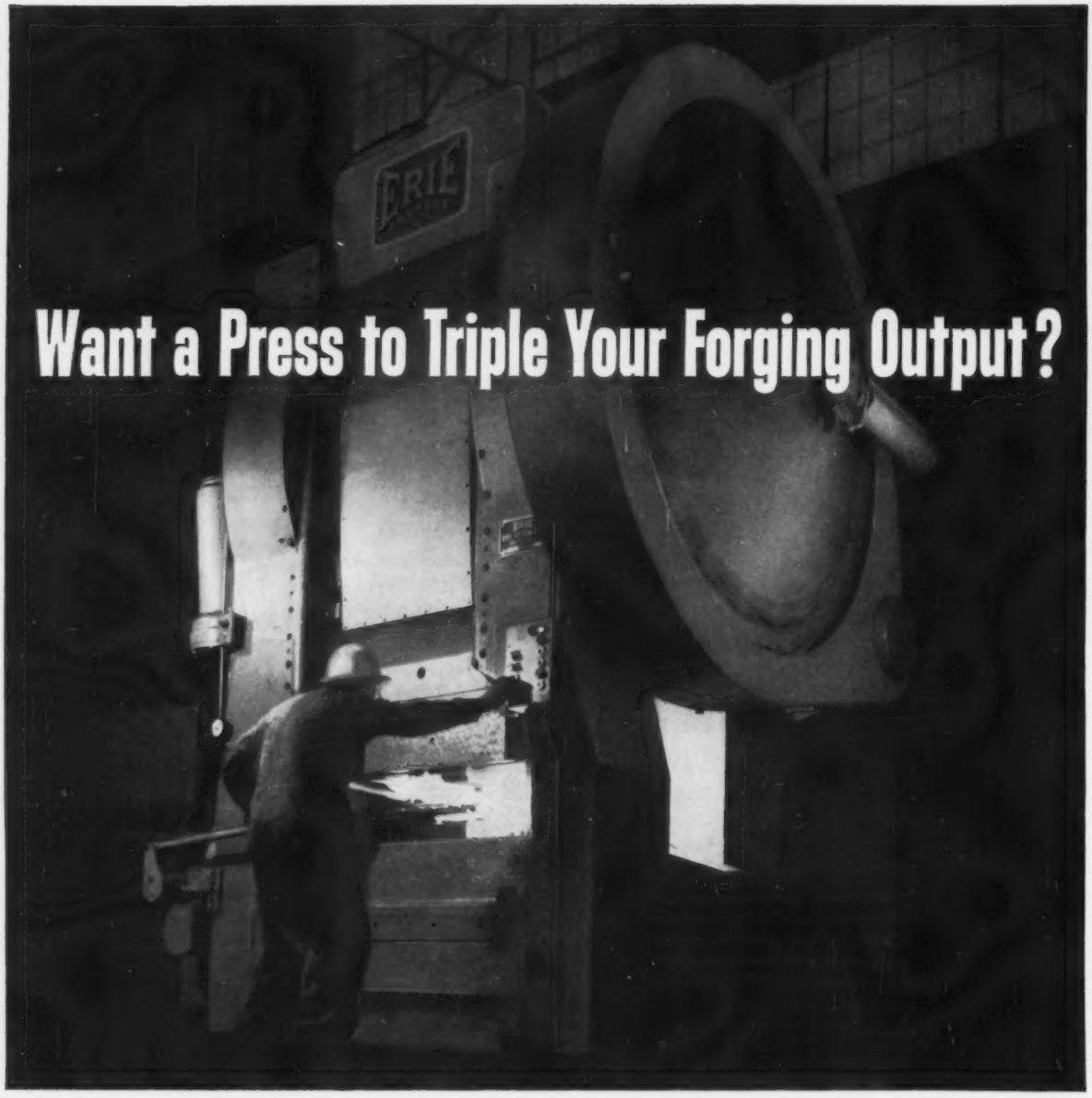
Where Do They Stand?—Steel users went into the strike with steel stocks of 23 to 24 million tons. But these inventories are not in balance, not evenly distributed. P. 99

NEXT WEEK

EXOTIC METALS

Make Them Practical — Special equipment is ironing out production snags in treating special metals to meet tomorrow's problems. Next week's technical feature covers the problem of getting consistent quality and adequate volume.





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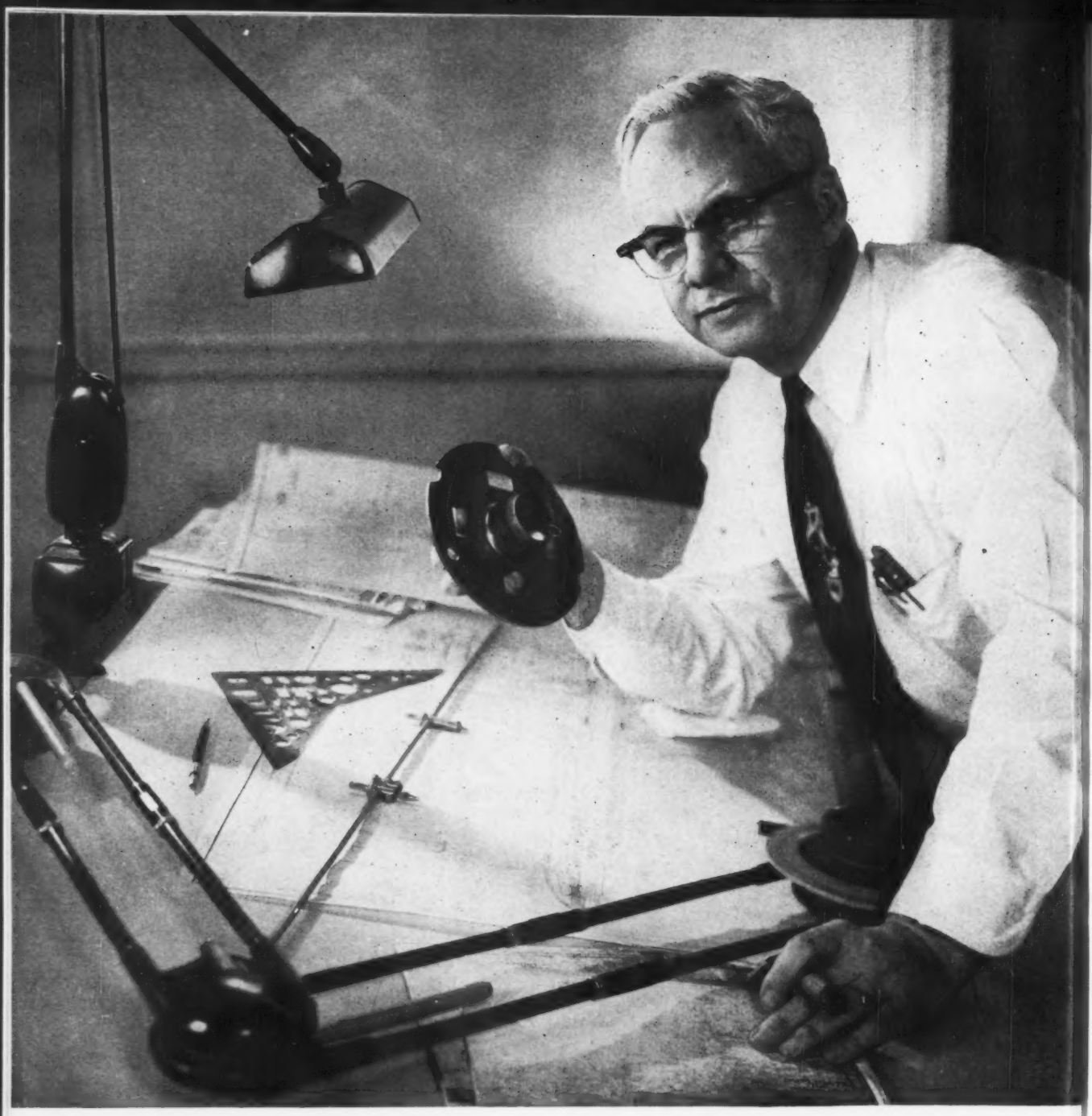


"When you design for quality the steel is important" —ALBERT R. COLEMAN—DIRECTOR OF ENGINEERING

"Steel quality is all important to the designer," says Albert Coleman, Director of Engineering at Whirlpool's Clyde, Ohio plant, "and we've found we can trust Sharon to deliver what they promise."

Sharon engineers know the importance of working in close coordination with engineers like Mr. Coleman to thoroughly understand the application and then make certain the steel supplied will do the job for which it was intended.

Better appliances depend on steel. Leading appliance makers, like Whirlpool, have learned they can depend on quality steels—consistently—from the mills of the *Sharon Steel Corporation, Sharon, Pa.*

SHARONSTEEL **SHARON** *Quality* **STEEL**

Steel Labor Impasse
What Will Be the Outcome?

When last minute behind-the-scenes efforts failed to stop the steel strike, a new era began. Where it will lead no one knows at this moment.

Steel management is a focal point in a move to instill some statesmanship into union leaders and into contracts. There is no turning back from this goal.

This move to regain managerial rights was also tied into a plan to capture the public's mind. Now that the strike has begun the real battle for the public mind begins.

While the industry strives to keep the public image it has made, the steel union will be trying to batter down that image.

The die is now cast. The union has the backing of the men now that the strike is on. Management certainly knew this despite public opinion polls taken before the strike.

Speculative back-to-work thinking by some people can hardly be taken seriously. Union monopoly is still uncurbed by government or by law, so that any attempt to bring back such old-time tactics might explode into violence and bloodshed.

Dave McDonald can't—or won't—back down and take local practice language he feels will lose what has been gained. This type of union thinking prevails at the current crossroads. That's why the usual strike pattern prevails.

Steel union chiefs may not yet see the significance of steel management's stand. No realistic steel leader would try to bust the union or reduce Mr. McDonald to a shell. Nor would such a management man contribute to embarrassment of President Eisenhower. If these things came about they would be a by-product of a last-ditch stand for principles.

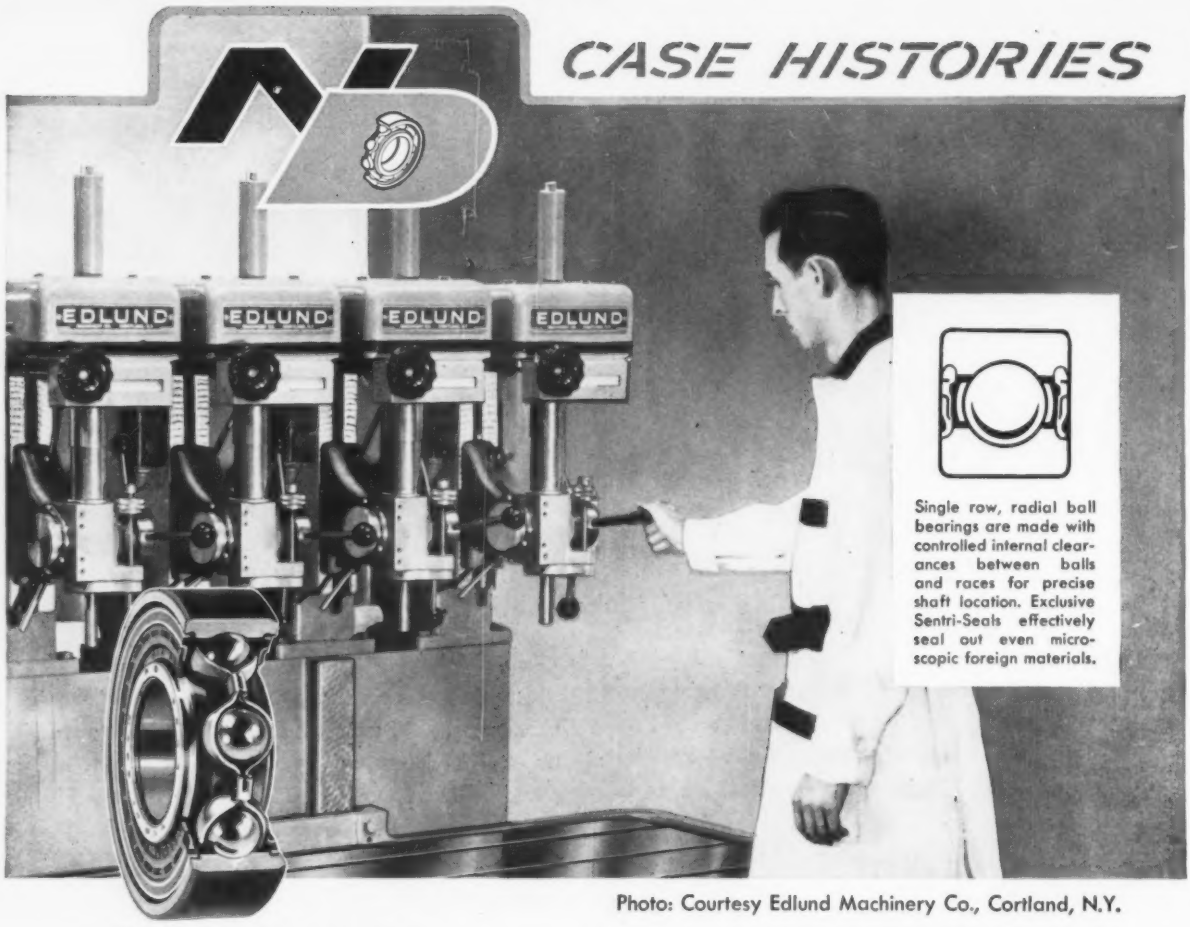
This may be the time to take this last stand before all that is left goes down the drain. This same thinking will, of course, be taken by the union. It, too, will fight to the last ditch to protect what it thinks are rights and privileges. By doing this the union may be laying the ground work for anti-trust laws covering unions.

The steel strike may be settled by a long and bitter battle or by a breaking up of the steel front, or by statesmanship thinking by the union. If either of the first two possibilities results, there will be lasting trouble. If the last possibility prevails, the crisis is over. A final horrible move might be governmental control of the industry at some future point.

That would be unthinkable!

Tom Campbell

Editor-in-Chief


CASE HISTORIES
EDLUND
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Single row, radial ball bearings are made with controlled internal clearances between balls and races for precise shaft location. Exclusive Sentri-Seals effectively seal out even microscopic foreign materials.

Photo: Courtesy Edlund Machinery Co., Cortland, N.Y.

Ball Bearing Design Adds Efficiency... Cuts Relube Maintenance In Drilling Machine

CUSTOMER PROBLEM:

Tool manufacturer requires minimum maintenance ball bearing design for new high-speed multiple drilling machine.

SOLUTION:

N/D Sales Engineer, cooperating with company engineers, recommended New Departure ball bearings with exclusive Sentri-Seals in place of conventional open bearings. These ball bearings, sealed and lubricated for life, virtually eliminated bearing relubrication maintenance. In addition, these sealed bearings accounted for a savings in parts and assembly time by eliminating costly lubrication plumbing and fittings. What's more, the application has proved so successful, the customer has had other types of drilling machines redesigned to use New Departures.

If you're working on new machine designs, why not call on New Departure? There's probably an N/D *production* ball bearing that will help you, and, at a lower cost! For more information write Department S-7.

Replacement ball bearings available through United Motors System and its Independent Bearing Distributors

NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

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Ductile Molybdenum Sheet

Where temperatures as high as 1000°F have been used in forming many molybdenum parts, a new high-ductility molybdenum sheet can now be bent at right angles or double on itself at room temperature. Benefits are of particular significance in thicknesses ranging from 0.025 to 0.125 in. The material will be ideal for punching and deep drawing operations.

Faster Stainless Output

Adding a new iron-chromium-carbon alloy in last stages of stainless processing quickly brings the heat to right quality. Since the low-carbon alloy melts faster than older alloys, processing is now about 15 minutes faster for a 70-ton heat, reports the alloy's developer.

Electrochemical Inspection

A report just released outlines a non-destructive method for 100-pct inspection of sintered metal parts. It's based on the principle that surface energy of a material is dependent on its surface character. Results of study confirm that electrochemical potential of a material is sensitive to degree of sintering and strength.

Nylon-Coated Bearings

Watch for developments in nylon-coated bearings. A major automotive equipment manufacturer reports initial findings give these bearings the lubricating effect of nylon, but without the plastic deformation that has always been a problem.

Inflatable Metal Tubing

Experimental production will begin this fall of light-wall seamless metal tubing that can be shipped in ribbon form and inflated at point of use. Shipping costs are economical since only the tube walls are shipped and not the "hole." The entire ductwork for the heating system of a seven-room house could be shipped in a box the size of an orange crate instead of in trailer-truck loads. Coil lengths of the strip tubing can be as long as 15,000 ft.

Gage by Numerical Control

In fully automatic operation, a new numerically controlled gaging machine checks parts of practically any shape at any desired number of coordinate points on both inner and outer surfaces. Input data is carried on easily prepared perforated tape. Digital readout makes it possible to store, record, or mathematically process the gage data.

Probe Mantle for Resources

Using a sea-going rig, an American scientific team plans to drill more than six miles straight down into the earth's 1800-mile thick mantle. The object is to bring up core-drill samples of materials. It may answer the pressing question as to whether the earth can continue to yield enough mineral resources to support future human and scientific progress.

Boost Size of Farm Tractor

Farm equipment manufacturers are already considering the advisability of huge high-horsepower four-wheel drive tractors. These would outperform anything now built. Farmers have already jumped the gun and are hitching two heavy tractors in tandem to rip up soil at unprecedented speed.

Power for Midget Subs

Navy midget submarines, if built, probably won't have atomic engines. Development of nuclear engines for tiny subs has been discussed in national defense circles. But best-informed Navy opinion is that this would not be the best use of atomic propulsion. Only fleet-type submarines have the dimensions and the shielding to use atomic engines efficiently.

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Fastener Dollar

Sir—I will appreciate receiving ten copies of the article "How to Get More for Your Fastener Dollar" which appeared in the July 2 issue.—C. M. Sayre, Manufacturing Consultant, Westinghouse Electric Corp., Staunton, Va.

Sir—We wish to commend you on this article in your July 2 issue. The information was presented in a most interesting and helpful manner, and should prove of great value to many companies.

We would appreciate your kind cooperation in sending us about twelve copies which we would like to submit to our mills abroad and to our various representatives. We represent mills in Belgium, Luxembourg, and France in this country, and our principals have found many of your articles extremely helpful.—V. V. Shick, Indussa Corp., New York, N. Y.

Sir—I was very interested to read all the sections of the special report on mechanical fasteners which appeared in The IRON AGE of July 2. We can use these articles in our daily work and we would appreciate receiving 10 complete reprints of all the sections.—H. T. Kennedy, President, H. T. Kennedy Co., New York, N. Y.

▪ **Reprints have been mailed.—Ed.**

Behind the Curtain

Sir—I read with interest your memorandum about Russian readers of Iron Age. But I am astounded to note that until last year you had only one subscriber in the USSR.

The reason I am astounded is that in 1956 I was in Russia and visited four of the major steel plants and found copies of the Iron Age in at least six different offices.

It certainly would be interesting to find out who outside of Russia was subscribing to Iron Age and sending it into the USSR.

I also would like to learn how to subscribe to Russia's number one magazine on steelmaking (Stal) which is now available in English. Would you please let me know where this subscription can be placed.—Lee Wilson, Chairman of the Board, Lee Wilson Engineering Co., Inc., Cleveland.

▪ **The copies of Iron Age which you saw on your Russian visit were probably not the original issues. What the Russians did was take one copy, bind it and reprint it as a photo-offset job. Then it was bound up again and color sometimes added to the front cover.**

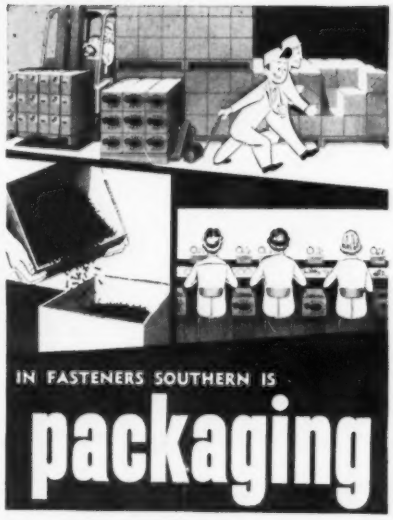
The original could have been the one copy we sent to the Lenin library—or the Russians may have subscribed through a "blind" here in the U. S. or abroad.

The Iron Age and other technical journals were circulated through Russia in this way during the period when the State Department asked us not to send in originals.

As for your other question, Stal, in English, is available at a subscription price of $58 a year.

Write to: The Secretary, British Iron and Steel Institute, 4 Grosvenor Gardens, London SW 1.—Ed.

"They told me to get the bugs out of it."



You asked for it, and Southern Screw produced it—a completely redesigned packing system to save you time and money straight across the board, from Receiving to Production line. Southern Screws are shipped to you in units of 36 cartons, steel strapped to a free 2-way entry 30" x 30" pallet. The 9" x 9" x 6½" carton is 275# test board. Telescopic top, with industrial adaptation of Southern's famous "EZ to C©" label on top and side, provides extra bulk fastener container for use at different production line stations. Whether you store and handle components manually or mechanically, see how Southern's new bulk packaging means dollars to you in time and production savings. Immediate shipment from Southern's 1,500,000,000-piece stock.

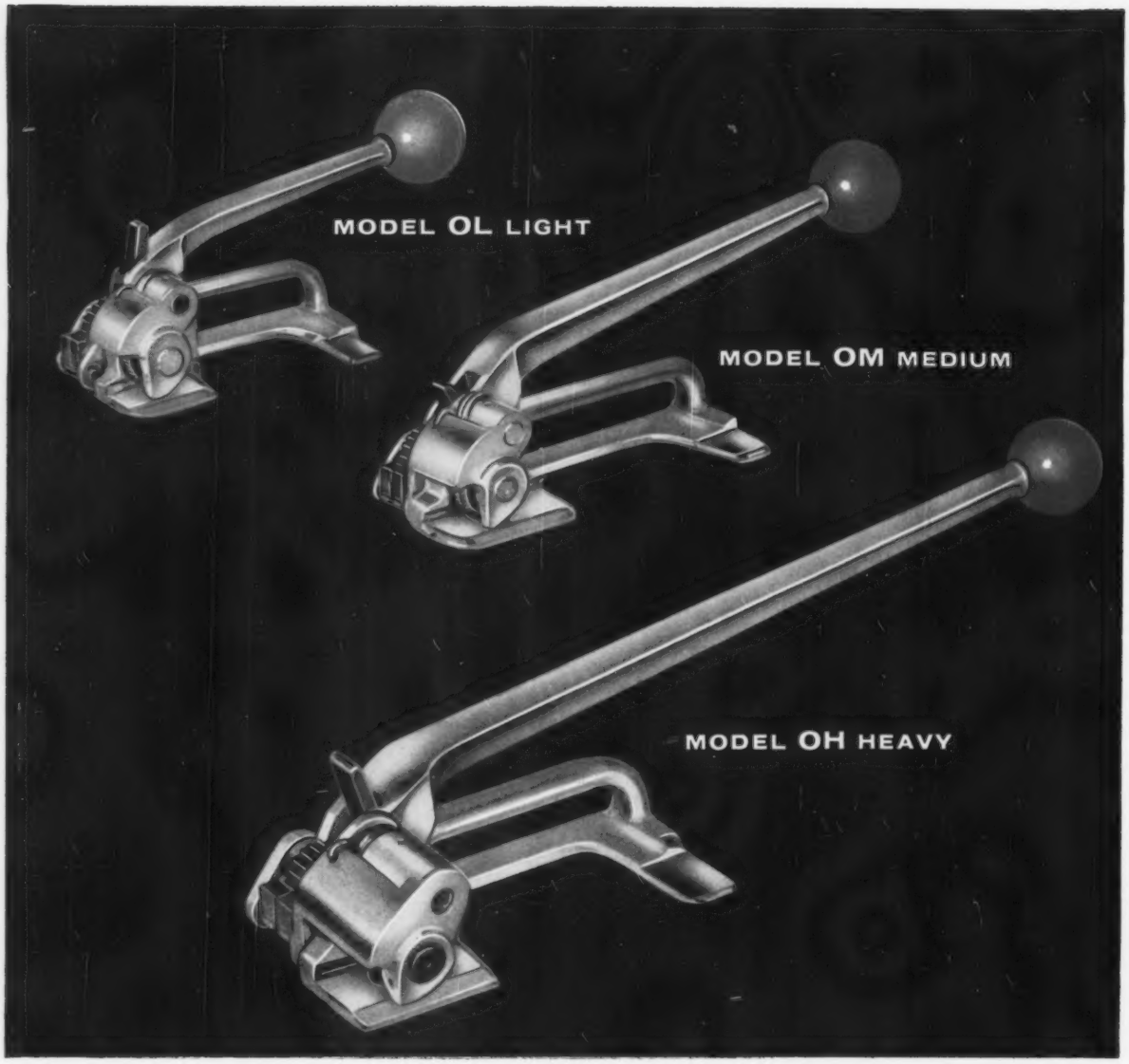
Write for Southern's new stock list and bulk packing chart BP-2. P. O. Box 1360, Statesville, N. C.

Tapping Screws • Wood Screws Machine Screws & Nuts • Stove Bolts • Carriage Bolts • Dowel Screws Hanger Bolts • Drive Screws

Manufacturing and Main Stock in Statesville, North Carolina

Warehouses:
New York • Chicago • Dallas • Los Angeles

Southern SCREW COMPANY
STATESVILLE • NORTH CAROLINA



Select the tool *just right* for your needs from the STANLEY Line of "O" Tighteners

For tensioning steel strapping with maximum efficiency no matter what type, size, weight or shape your product or package is. The Stanley "O" Tightener is lightweight, sturdy, versatile; has unlimited takeup. Seals applied behind tensioning wheel eliminate strap waste.

MODEL	OL 3	3/8" STRAP
	OL 4	1/2"
	OL 5	5/8"
MODEL	OM 5	5/8" STRAP
	OM 6	3/4"
MODEL	OH 6	3/4" STRAP
	OH 10	1-1/4"

Strapplication Data available from Stanley Steel Strapping, Division of The Stanley Works, Dept. G, 1317 Corbin Ave., New Britain, Conn.

INSURE IT—SECURE IT WITH STANLEY STEEL STRAPPING

STANLEY
REG. U.S. PAT. OFF.

AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works, New Britain, Conn.—hand tools • electric tools • builders hardware • industrial hardware • drapery hardware • automatic door controls • aluminum windows • stampings • springs • coatings • strip steel • steel strapping—made in 24 plants in the United States, Canada, England and Germany.

In Canada: Steel Strapping Division, The Stanley Works of Canada, Ltd., Hamilton, Ontario

Steel Strike Mediator

Entry of Federal Mediator Joseph F. Finnegan into the steel strike focused attention on the man and his service.

But as far back as April 9 IRON AGE readers had the benefit of a full-scale report on Mr. Finnegan's mediating philosophy. After pointing out 1959 would be a "pretty rough bargaining year," he touched on several changes in labor-management relations.

Holding the Line—Said Mr. Finnegan: ". . . In today's bargaining, money is only indirectly the principal issue. Management's problem seems to be that of trying to get maximum production and at the same time hold the line on lower unit labor costs—e.g., stepped up efficiency of operations, better production controls, plant relocation and changes, manning problems, stiffer discipline, and automation."

Settlement Hints? — And steel management bore Mr. Finnegan out in pre-strike talks by insisting the union modify restrictive work rules to improve efficiency.

Did the article suggest any wage patterns that might be used now in settling the strike? Not directly. But the federal mediator did note that "direct wage increases (in 1959) will not be far from last year's median wage increase of around 8-10¢ an hour."

Dealing With Wheeling

There will never be a day when this fast-moving world doesn't come up with something new.

A while back one of our editors was doing an article about mobile homes (Mobile Homes Use More Metal—July 2 issue). In researching it he discovered Michigan State University offers a four-year course in mobile homes leading to a Bachelor of Science degree.

Objective: Training students to meet the needs of the mobile homes industry for technical personnel.

Offered are specialized courses dealing with the manufacture and distribution of mobile homes, and with the establishment and operation of mobile home parks.

Included are field trips to manufacturing plants, dealerships, and mobile home parks.

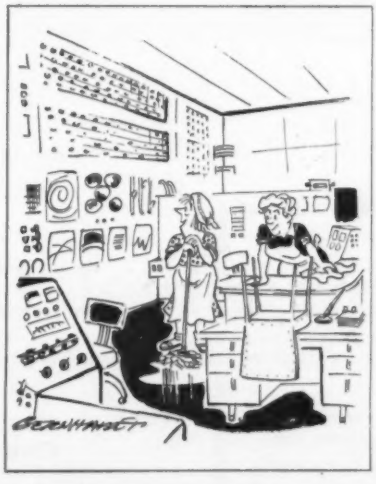
Cure for Ailing Clocks

Wall clocks in the new Senate Office Building recently suffered from a strange malady—overweight hands.

Between the hours of 12 and 6 they moved along easily enough. But time was clearly out of joint from 6 to 12 while the heavy hands struggled wheezingly uphill.

The result: Lawmakers late for appointments. Committee sessions disrupted.

But clockdoctors found the trouble and prescribed lightweight aluminum hands for the timepieces. And now the hours move by again at their normal pace—on both sides of the clocks.



"When you stop to think about it, Elsie, you and I are about the only ones around here who can't be replaced by a machine."

THE BIGGEST, NEWEST IDEA IN WORK GLOVES!

NORTH PVC GLOVES

...job-proved for extra safety, extra wear

Check these advantages . . .

- **Extremely tough**—Last two to five times longer than ordinary work gloves
- **Very flexible**—Give greater dexterity than any other coated gloves
- **Highly resistant**—Nonflammable, non-oxidizing and resistant to practically all chemicals—will not crack or peel

Give your employees the maximum protection afforded by North PVC Gloves. There's a size to fit every hand comfortably, reducing fatigue and increasing efficiency. As a result, your production will go up, your accident rate will go down. Available in knit-wrist, band top and gauntlet types—palm and partial back coated styles.

FREE OFFER—On your business letterhead, kindly furnish us complete details of your working conditions—and we will send you a sample pair.

1600 SERIES. Fully coated, heavy duty.

1800 SERIES. North-Grip—Permruff surface; for handling slippery surfaces.

We also make a complete line of North PVC chemical and foul weather protective garments and the famous Jomac loop-pile industrial gloves, handguards and safety sleeves for up-to-shoulder protection.

JOMAC Inc.

Dept. K, Philadelphia 38, Pa.

Associated companies and distributors throughout the world

The Show Will Go On

NO CRYSTAL BALL

Lacking a crystal ball—and under pressure to meet July publication deadlines, we released this ad-message not knowing whether we would or would not be working now.

WORKING?

Assuming, hopefully, that we are working now —we are first cleaning up any June backlog, then proceeding with orders scheduled for July.

The June balances wouldn't have amounted to much percentage-wise anyhow because we didn't overbook orders nor pyramid promises. Some June steel was delayed as a result of production setbacks, due chiefly to minor breakdowns from pushing our equipment to extremes. Customers affected were notified immediately.

SHUT DOWN?

Assuming that we *are* shut down now—there's nothing to do except wait for a contract settlement, hoping it might come quickly.

LOOKING AHEAD

As matters stand we are booked solid for July. August and September are substantially spoken for, and some customers are coming in already with their fourth quarter specifications.

In any event, union-management differences will be resolved in one way or another and *the show will go on*. We expect to be prepared to resume near-capacity operations at our Portsmouth, Detroit and Eastern plants as soon as the all-clear signal is given . . . and to continue to take care of our customers' normal monthly requirements, as always.

MEANWHILE

Strike or no strike, our DSC Customer "Reps" are on the job to help you with yours. For complete information on DSC products and services—or to get your name on our ad-preprint mailing list and receive our brief, informal letters that accompany them monthly—just say the word to our nearest "Rep" or drop us a line to Box 4308, Detroit 9.

Customer Satisfaction—Our No. 1 Job

DSC

Detroit Steel Corporation

General Sales Office, Box 4308, Detroit 9, Michigan

DSC PRODUCTS: Coke . . . . Coal Chemicals . . . . Pig Iron
Basic Open Hearth Steel Ingots, Blooms, Slabs, Billets, Rods
HR and CR Sheet and Strip . . . . . Flat CR Spring Steel
Mfrs.' and H.C. Specialty Wire . . . . . Welded Wire Fabric

The PROOF of DSC STEEL is in its PERFORMANCE on YOUR job

Customer "REP" Offices
in Principal Cities

COPYRIGHT DETROIT STEEL CORPORATION 1959

COMING EXHIBITS

Instrumentation Show — Sept. 21-25, International Amphitheatre, Chicago. (Instrument Society of America, 313 Sixth Ave., Pittsburgh 22.)

Metal Show — Nov. 2-6, International Amphitheatre, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

MEETINGS

SEPTEMBER

Pressed Metal Institute — Annual meeting, Sept. 13-17, Estes Park, Colorado. Institute headquarters, 3673 Lee Rd., Cleveland.

American Mining Congress—Metal mining-industrial minerals convention, Sept. 14-17, Denver, Colorado. Congress headquarters, 1200 18th St., N. W., Washington, D. C.

American Die Casting Institute—Annual meeting, Sept. 15-18, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

National Petroleum Assn.—Annual meeting, Sept. 16-18, Traymore Hotel, Atlantic City, N. J. Association headquarters, Munsey Bldg., Rm. 958, Washington 4, D. C.

Steel Founders' Society of America—Fall meeting, Sept. 21-22. The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland.

Electronic Industries Assn.—Quarterly meeting, Sept. 22-24, Plaza Hotel, New York. Association headquarters, 1721 DeSales St., N. W., Washington 6, D. C.

Porcelain Enamel Institute, Inc.—Annual meeting, Sept. 24-26, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington 4, D. C.

Association of Iron & Steel Engineers—Convention, Sept. 28-Oct. 1, Sherman Hotel, Chicago, Asso-

(Continued on P. 16)

WEBSTER

gal-va-nize (găl/və nīz/), *v.t.* 1. to simulate by or as by a galvanic current. 2. to coat (metal, esp. iron or steel) with zinc.

this is modern galvanizing

. . . with *Zincilate*®

Zincilating *is* galvanizing, brought up-to-date. Now, true galvanic protection can be provided for iron, steel or aluminum without the costs and nuisance of a complex, time-consuming process.

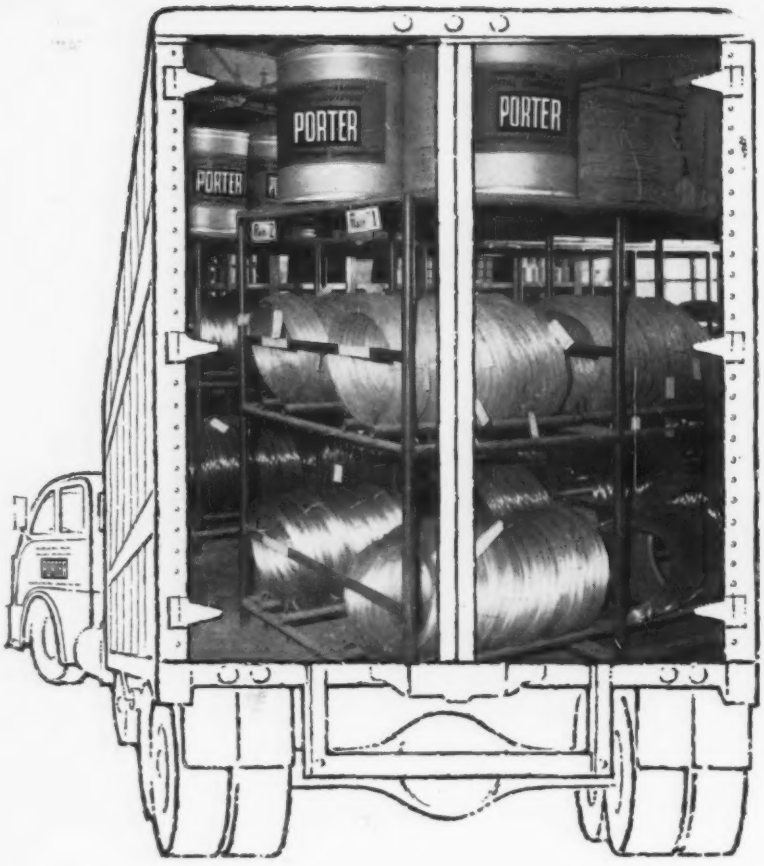
With Zincilate, you can . . . galvanize any component, product or structure—regardless of its size or shape . . . galvanize anywhere—in your plant or at the installation . . . galvanize any time—before, during or after fabrication . . . galvanize on production lines or on maintenance work. You can even repair hot-dip galvanize without pre-treatment.

If galvanize in any form or method enters your production or maintenance picture, you should know about Zincilate. Telephone, wire or write, outlining your present use of galvanize; we'll furnish the facts—you be the judge.

PROTECTION that SELLS your PRODUCTS

INDUSTRIAL METAL PROTECTIVES

402 Homestead Ave. • Dayton 8, Ohio • BAldwin 2-6747, 2-6748



Here's what we mean by "off-the-shelf" delivery

These coils of stainless steel wire are waiting to be shipped out at a moment's notice from our stainless-specialty plant.

Wire *precision-drawn* from Inco alloys is our specialty. Getting it out to you on time is our pride. Coming back for more—and more—is a wonderful habit of our customers.

If your design calls for wire in Monel*, Inconel*, or stainless alloys—try the products and service of our Alloy Works. For full information, write or call *Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, N. J.*

**Registered Trade Marks of the International Nickel Company, Inc.*

RIVERSIDE-ALLOY PORTER METAL DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Copper and Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

EXHIBITS, MEETINGS

(Continued from P. 15)

ciation headquarters, 1010 Empire Bldg., Pittsburgh.

American Welding Society — National fall meeting, Sept. 28-Oct. 1, Hotel Sheraton-Cadillac, Detroit. Society headquarters, 33 W. 39th St., New York.

OCTOBER

National Assn. of Sheet Metal Distributors — Annual meeting, Oct. 4-7, Atlantic City, N. J. Association headquarters, 1900 Arch St., Philadelphia 3.

Truck Body & Equipment Assn., Inc.—Annual convention and exhibit, Oct. 5-7, Sherman Hotel, Chicago. Association headquarters, 1616 "K" St., N. W., Washington 6, D. C.

American Gas Assn.—Annual convention, Oct. 5-7, Chicago. Association headquarters, 420 Lexington Ave., New York.

Society of Automotive Engineers—National aeronautic meeting, aircraft manufacturing forum and engineering display, Oct. 5-10, Ambassador Hotel, Los Angeles. Society headquarters, 485 Lexington Ave., New York 17, N. Y.

Gray Iron Founders' Society, Inc.—Annual meeting, Oct. 7-9, Fairmont Hotel, San Francisco, Calif. Society headquarters, 930 National City-E 6th Bldg., Cleveland.

Conveyor Equipment Manufacturers Assn.—Annual meeting, Oct. 10-13, Grand Hotel, Point Clear, Ala. Association headquarters, One Thomas Circle, Washington, D. C.

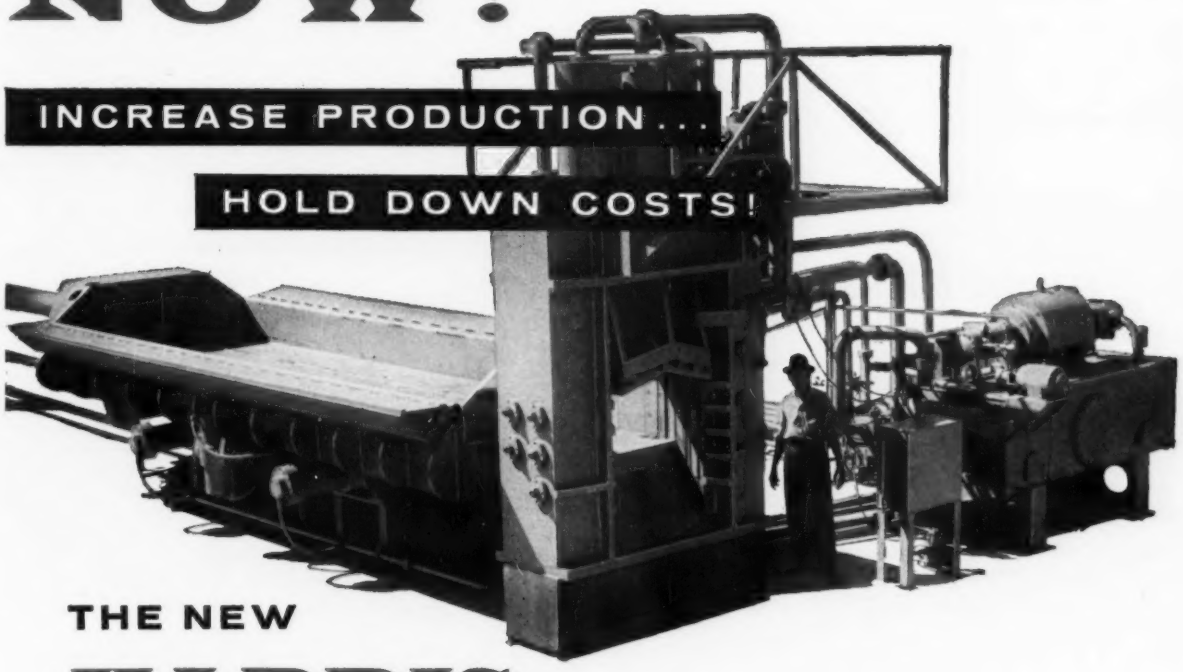
American Society for Testing Materials—Pacific area national meeting, Oct. 11-16, Sheraton-Palace Hotel, San Francisco, Calif. Society headquarters, 1916 Race St., Philadelphia.

Wire Assn. — Annual convention, Oct. 12-15, Statler Hotel, Cleveland. Association headquarters, 453 Main St., Stamford, Conn.

MODERNIZE NOW!

INCREASE PRODUCTION...

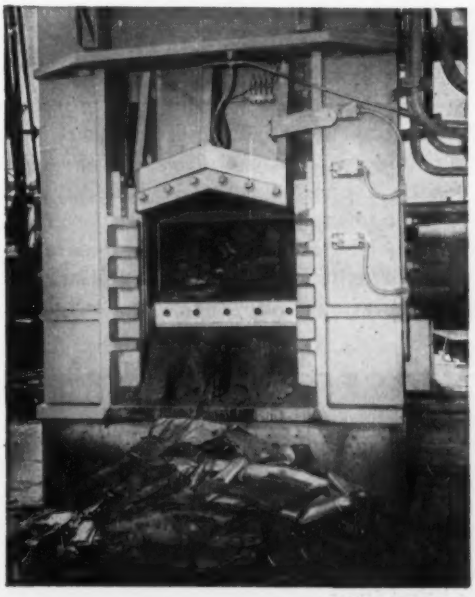
HOLD DOWN COSTS!



THE NEW

HARRIS BS-350 BALER-SHEAR

AUTO FRAMES and bulky scrap work through easily. The Harris Baler-Shear was designed to eliminate problems arising from the preparation of bulky scrap. It incorporates the principles of baling and shearing.



SPECIFICATIONS

size of charging box	264 x 83 x 41"
shear opening height	20"
shear opening width	36"
shear force	350 tons
floor space required	55' x 20'

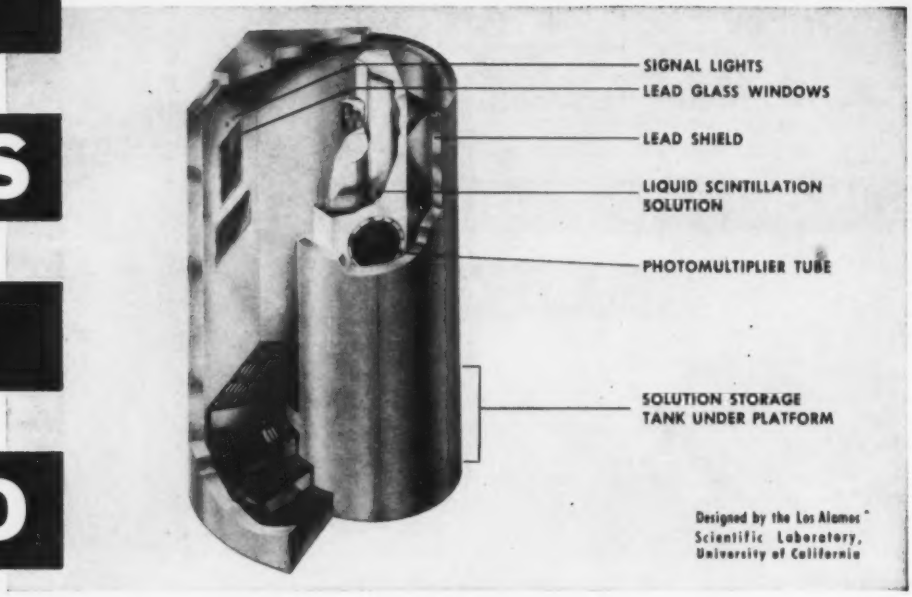
HARRIS FOUNDRY & MACHINE CO.

Hydraulic Engineers Since 1889

CORDELE, GEORGIA

Talk with a Man from Harris

16 TONS OF LEAD



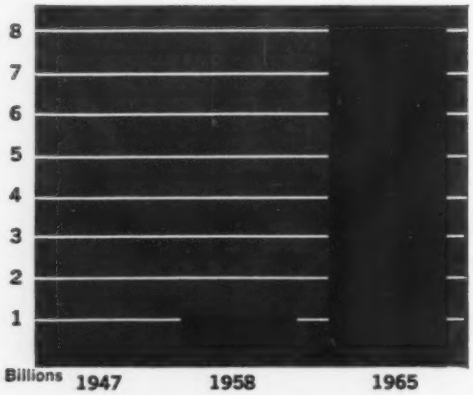
Provides The Shielding In This Walk-In HUMAN RADIOACTIVITY COUNTER

The need for instruments that can rapidly and accurately determine very small amounts of radioactivity in people and foodstuffs is urgent. The concern over world-wide fallout from nuclear weapons testing and the problem of efficient monitoring as part of power reactor development emphasize this need. In both cases, large numbers of people are potentially exposed either directly or through the wider, indirect hazard of contaminated food.

This radiation counter was part of the United States exhibit at the Geneva Conference of Peaceful Uses of Atomic Energy. The 16 tons of lead provides a thickness of 3 inches of shielding in all directions. The shape of the shield resembles a snail shell. With this design, there is no direct "line of sight" from outside into the very sensitive gamma-ray counter . . . and eliminates the inconvenience and expense of a heavy door.

Lead, having the best shielding property of all common metals was chosen to provide maximum protection from gamma-rays with minimum weight and floor space. The metal's relative availability and economy was another factor. The cost of the vital 16-ton shield amounted to about 10% of the Geneva counter's total cost. The importance of this application and its potential is exemplified by the chart shown below.

ESTIMATED CUMULATIVE EXPENDITURES FOR REACTOR, EQUIPMENT, FACILITIES



Source: NUCLEONICS, September, 1957, p. 33

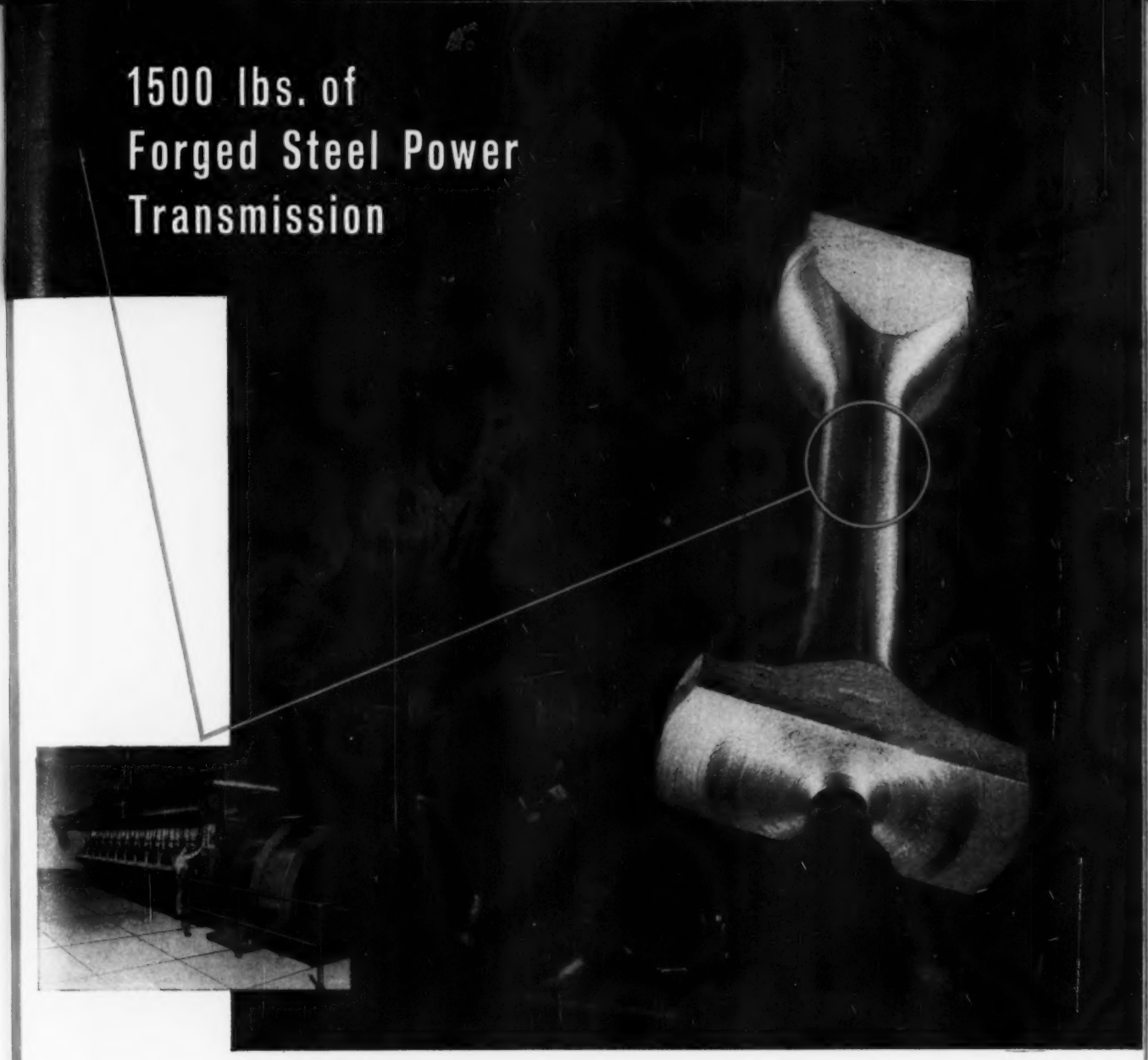
ST. JOSEPH LEAD COMPANY

250 Park Avenue — New York 17, N. Y.

ST. JOE

The Largest Producer of Lead in the United States

1500 lbs. of Forged Steel Power Transmission



This 1500 lb. forged steel diesel engine connecting rod is taking a "dressing down". At working weight (1400 lbs.) it will transmit horse power in a municipal power plant. Another photographic example of the diverse sizes and weights of component parts going through our forge shops daily. You are assured of the same engineering and metallurgical quality control, the same careful craftsmanship which characterize steel forgings weighing 80 tons and more, when you place with us the responsibility for making any size forged steel component part.

Regardless of the size or weight of steel forgings or castings you require, it will pay you to consult with us.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

TEXACO ORGANIZED LUBRICATION CAN HELP YOU...

Get rid of the "guns" that "misfire"

His grease guns are aimed at your profits; they can help boost them—or eliminate them altogether. Here's why:

You used to need a different grease for nearly every job. That meant 20 or 30 lubricants in the plant, with the almost inevitable danger of misapplication — and damaged machinery.

Unless you're operating on the basis of a modern lubrication survey, *the chances are that this situation still exists in your plant!*

A Texaco Organized Lubrication Plan uses a minimum number of proper oils and greases—including newly developed multi-purpose lubricants—to reduce your inventory by as much as 80% and virtually eliminate this problem.

Get the details on Texaco Organized Lubrication. Contact your local Texaco Lubrication Engineer or write for "Management Practices that Control Costs via Organized Lubrication."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. IA-102.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

Now—for FORM TOOLS

. . . complete Stock Service!

these 7 Grades regularly stocked for form tool applications...

- Electrite Double Six* (Type M-2)
- Electrite Corsair* (M3 Type 1)
- Electrite Crusader* (M3 Type 2)
- Electrite No. 1* (Type T-1)
- Electrite No. 19 (Type T-2)
- Electrite Vanadium (Type T-3)
- Electrite Dynavan* (Type T-15)

*Also available in XL® analysis for improved machinability

LATROBE

Metalmasters

LATROBE'S

fully-uniform DESEGATIZED®

HIGH SPEED STEELS

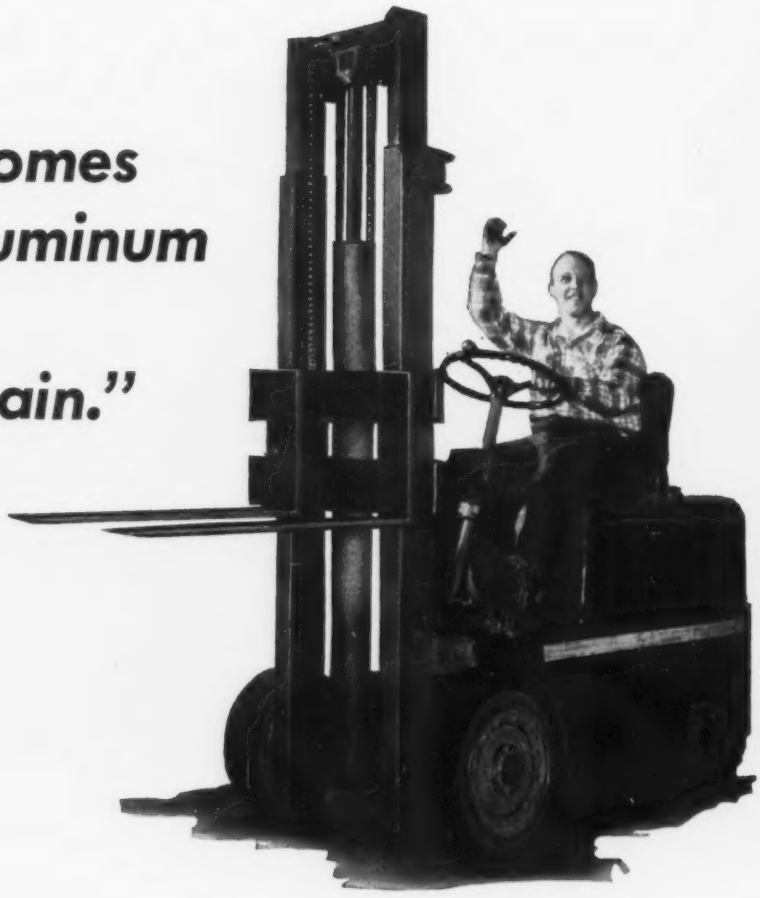
For stock sizes and technical assistance call your LATROBE representative today! . . . *or write for latest stock list.*

LATROBE STEEL COMPANY
LATROBE, PENNSYLVANIA

BRANCH OFFICES and WAREHOUSES: BOSTON • BUFFALO • CHICAGO CLEVELAND • DAYTON • DETROIT HARTFORD • LOS ANGELES • MILWAUKEE MIAMI • NEW YORK • PHILADELPHIA PITTSBURGH • SAN LEANDRO • TOLEDO

Integrated Service IS OUR BEST SALESMAN

"Hey, here comes our QSM aluminum —right on schedule again."

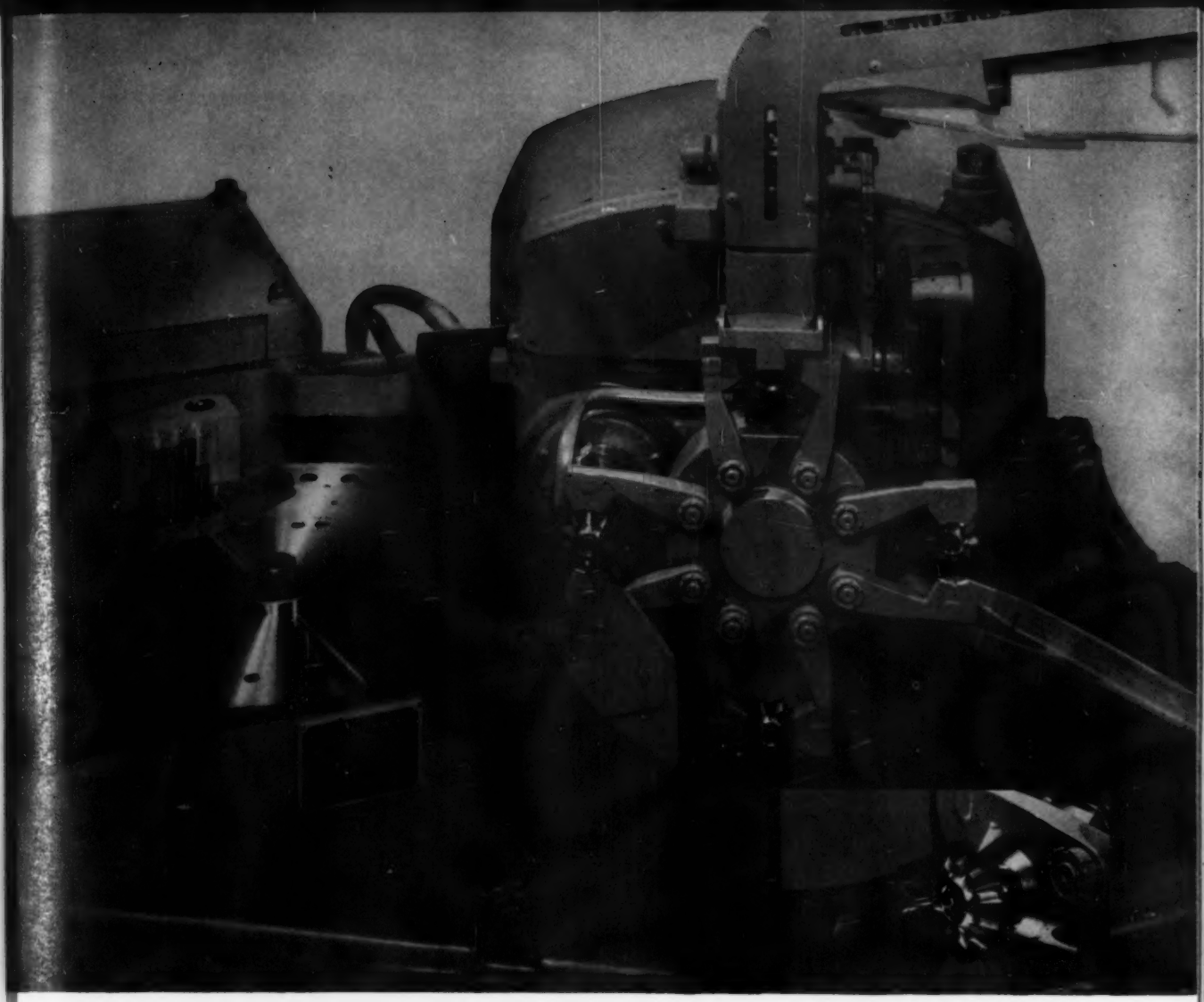


OF COURSE, your aluminum is on time. Reliable deliveries are routine for Quaker State Metals. That's because QSM aluminum is completely produced in a single, integrated plant—from hot mill to finished product. This makes possible the kind of precise scheduling that results in what we call *integrated* service.

Reliable delivery is just one advantage of QSM integrated service. In addition, production of your orders is faster; quality control is more precise; your service is more flexible and more personal; and there's much less red tape to annoy you. So next time you order aluminum sheet, coil, or tubing, think of Quaker State's integrated service.

QUAKER STATE METALS CO. • LANCASTER, PA.

DIVISION OF HOWE SOUND COMPANY



In Revacycle Method each blade of cutter is longer than its predecessor; there is no depthwise feed of cutter itself. One rotation of the cutter completes each space from the solid.

Fastest way yet to cut straight bevel gears

If you're looking for a faster, fully automatic way to cut straight bevel gears and pinions with conjugate surfaces and localized tooth bearings, consider the Gleason No. 109 Straight Bevel Revacycle® Machine.

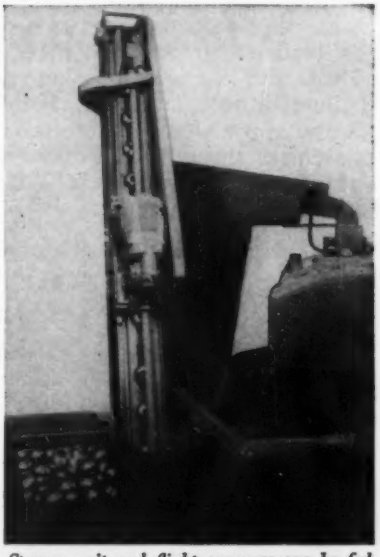
You rough, semifinish, and finish a tooth from the solid blank with a single rotation of the Revacycle cutter.

Now both 21″ and 25″ diameter cutters can be used on the No. 109 Revacycle Machine. The 25″ cutter cuts gears to a maximum depth of 0.600″. The 21″ cutter will cut to a maximum of 0.400″.

A new, completely automatic mechanism loads and unloads each gear. You can feed this loader manually or with a conventional belt conveyer.

The No. 109 Machine handles a wide range of automotive and farm machinery gears: up to 10″ diameter, 5:1 ratio, 1¼″ face width.

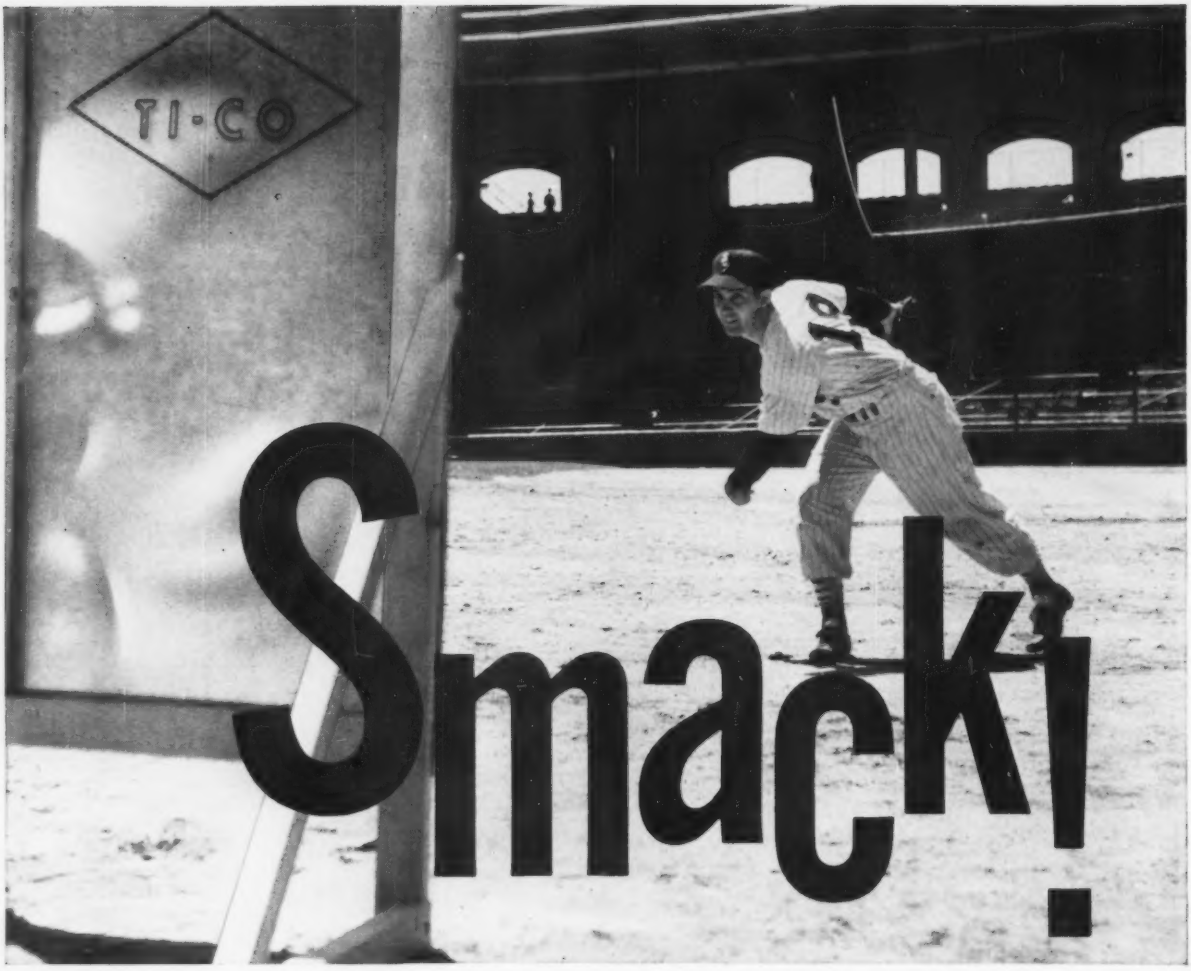
Send for our bulletin for information on both the machine and the Revacycle Method.



Storage unit and flight conveyer can be fed manually or with belt conveyer. Even with manual operation, one operator can handle a battery of machines.

GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.



PITCHER BILLY PIERCE FAILS TO FLAKE INLAND TI-CO®

We'd told Bill to go on out there and knock the spangle off that TI-CO galvanized sheet. But what we hadn't told him was that for years, manufacturers have been deep-drawing, spin-drawing, punching, perforating, crimping and Pittsburgh lock-seaming TI-CO with . . . never a flaking problem!

Sure, he dented it. In fact, TI-CO's easy formability is one of the nice characteristics of this versatile galvanized sheet. It's one of the many good reasons why manufacturers use TI-CO for so many new applications and products.

We think you, too, will like the fact that TI-CO galvanized sheet won't chip, peel, crack or flake no matter how tough the requirements. It is manufactured with dry, oiled or chemically treated surfaces to meet your production needs. It comes in sheets or coils in a wide variety of gages and widths. We'd like to tell you all about its specifications in our free TI-CO booklet which we'll be glad to send at your request. Meanwhile, for your galvanized sheet or coil requirements, it's a good idea to consult your Inland representative.

American League Pitcher Billy Pierce makes a close-up inspection—finds not a trace of flaking on TI-CO's zinc coating.

INLAND

INLAND STEEL COMPANY
30 West Monroe Street • Chicago 3, Illinois

Sales Offices: Chicago • Davenport • Detroit
Houston • Indianapolis • Kansas City • Milwaukee
New York • St. Louis • St. Paul

STEEL STRIKE'S IMPACT on the economy will be limited to steelmaking and allied and servicing industries at the start. But effects will worsen each day it continues. Steel users generally are pretty well fixed with inventory. But some shortages will crop up within a month or less.

LENGTH OF THE STRIKE is anybody's guess. But things look bad. It could turn out to be one of the longest in the history of steel labor relations. Issues are basic: Management's fight against inflation and for the right to manage its plants efficiently; labor's demand for higher wages and unwillingness to give up favorable precedents covering working conditions.

THE STRIKE has not shut down all of basic steel. For various reasons, plants representing more than 15 pct of the industry's ingot capacity of 147 million ingot tons are still operating. (See page 100)

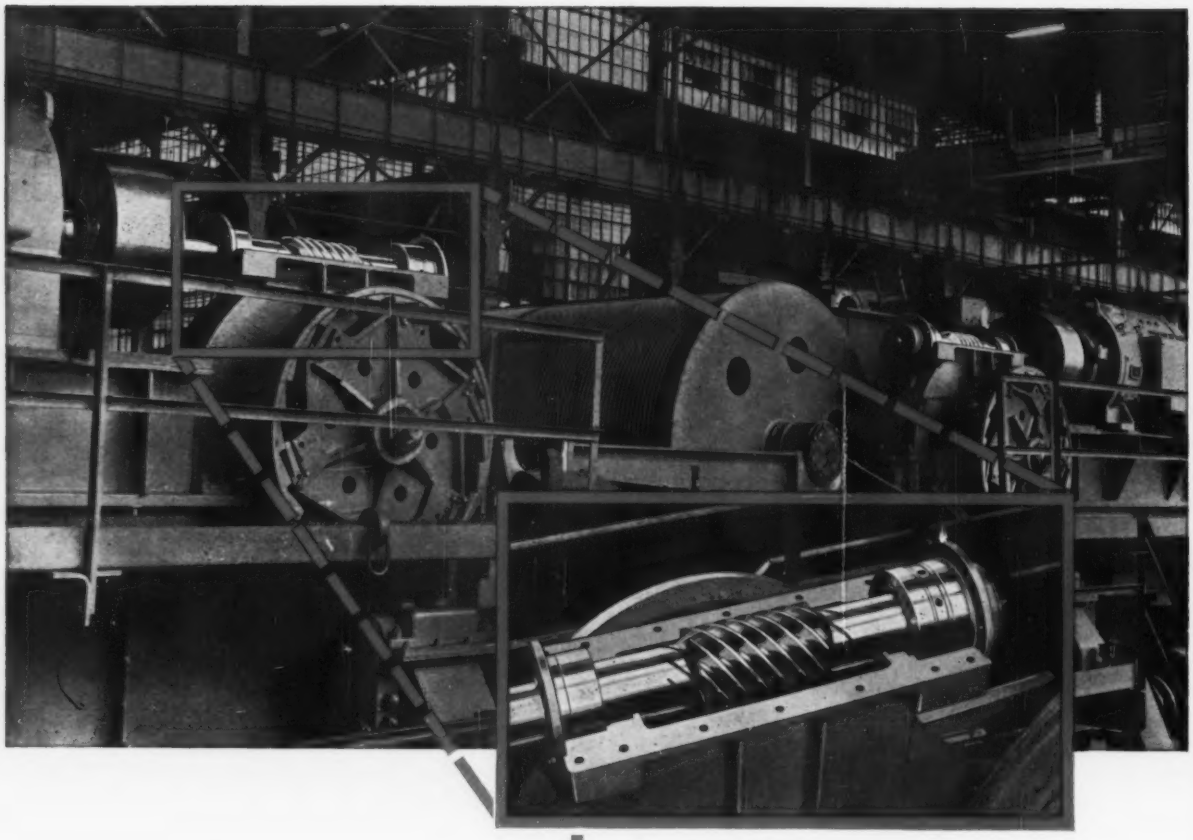
NEW CENSUS REPORTS this fall will be welcomed by marketing executives. Included will be data on employment, payrolls, cost of materials, value of shipments, and capital spending for the manufacturing and mineral industries.

NEW ALUMINUM PRODUCTION techniques may have explosive price effects. With the equipment now on hand one major producer estimates it can cut the price of flat rolled aluminum by about 10 cents. Principal problem: Getting the volume which will allow efficient use of equipment.

SHIPBUILDING WILL GET a shot-in-the-arm from congressional action giving the Maritime Commission authority to replace all subsidized operators' ships after a 20-year life period. A continuing program for commercial ship replacement is now expected.

RESTRICTIONS ON TIN production under the International Tin Agreement are having their effect on supply and prices. In the year before the export restrictions went into effect, Malayan miners turned out over 62,000 long tons of tin-in-concentrates. In the year after restrictions, they produced and exported only 34,000 long tons.

BUILDERS OF HEAVY POWER plant equipment are preparing for a spectacular growth rate in the power industry "during the next 10 years, at least." The reasons: Increased population, more rapid family formations, and more automation.



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By using standardized or custom-built Cleveland Worms & Gears, machine designers overcome the frequently troublesome problem of economically providing a quiet and efficient drive in a limited space. Cleveland components are available not only in standard sets but also in special sizes and ratios. Our wide range of special worm gear production equipment places us in an unparalleled position to furnish worms and gears of special designs. We maintain a complete and perpetual master worm and hob inventory that enables ready duplication of *any* Cleveland worm and gear ever made.

Our engineering specialists will gladly give you complete information on any application where specialized worm gear know-how is required. Call them today—they're as near as your phone. Or write for Catalog 201F—it gives complete data on built-in Cleveland Worms and Gears.

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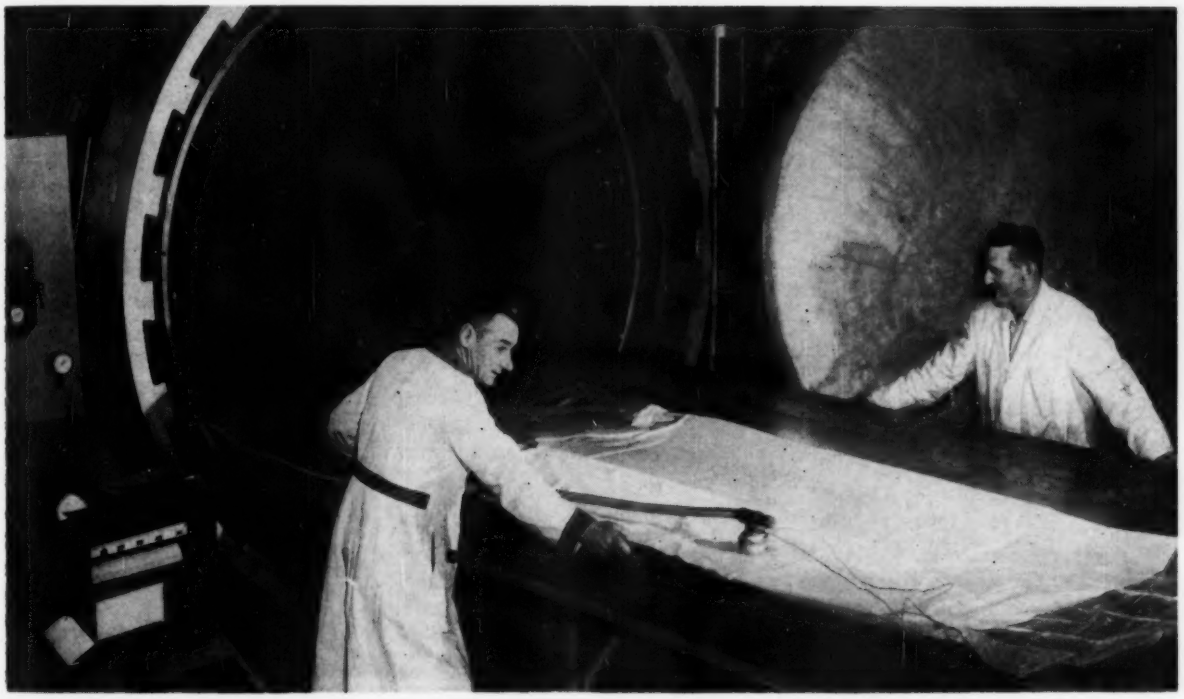


TECHNIQUE: Technicians making the Avro Arrow jet airplane devised methods to use their autoclave equipment to cure magnesium sheets easily, for skin sections of the aircraft (See page 28).

Magnesium Gets Another Chance At Many Markets

Fabricators are now looking past cost per lb to consider magnesium for some new uses.

The result: Magnesium is now being considered where it was once passed over.

■ Recently a market development specialist for a major manufacturer wrote this about magnesium in a report to his superior:

"Up to now very little consideration has been given to the use of magnesium. It's something that we usually classify as being reserved for applications where we are willing to pay a premium or run a risk of fire in order to achieve a weight reduction.

"However, there are some factors concerning it (magnesium) that make it merit consideration for our design work along with the more commonly used structural metals."

Without realizing it the marketing man was writing in a new era for magnesium.

Magnesium Saves — Pound for pound, magnesium costs more than its biggest competitor, aluminum. But Volkswagen is using magnesium motor blocks because of the savings in machining costs. And Westinghouse figures that because of magnesium's lighter weight it saves $250,000 a year by using magnesium die castings in its small motors.

The magnesium people say more companies are starting to look beyond just the price per pound. And they say this couldn't happen at a better time. They feel that the major considerations in selection of a metal for fabrication are all swinging around to favor magnesium. And they say because of this circumstance their metal is on the verge of commercial maturity.

Space Age Prompting — Recent dramatic applications have helped. Magnesium-thorium alloy sheet and extrusions make up about 40 pct

of the skin of the Titan intercontinental ballistic missile. And the Avro Arrow, a 1000 mph-plus jet interceptor, pride of the Canadian Air Force, made extensive use of magnesium alloy sheet, plate, and extrusions for fuselage, and even castings in the Orenda Iroquis jet engines.

Both applications involve speeds that generate high temperatures from air friction, and suggest that the old fire bugaboo of magnesium may not be so. More industry is probing this and coming up with positive results.

Karl F. Melde, in looking over the possibilities of magnesium for tooling plate for his company, Pilotless Aircraft Div., Boeing Airplane Co., says, "In a solid form, in sheets as thin as .020 to .030 in. heat is conducted away so rapidly from an applied flame that as soon as the flame is removed the magnesium fire goes out."

And on grinding dust, the really dangerous fire hazard, Mr. Melde notes that a dust collector using a fine water spray will just about nullify this problem.

Price Picture—The other main factors boosting magnesium are the improving price picture, the many new fabricating techniques that company probers are coming up with, and the apparent rediscovery of magnesium's availability, and machinability.

At current prices magnesium can compete on a volume basis. One market prober notes that a cubic inch of primary magnesium costs 2.34¢; primary aluminum costs 2.41¢.

. . . Getting Brighter—But the real factor in the price picture is the trend in the relationship of magnesium to aluminum. While magnesium's price hasn't changed since August 1956, aluminum has been inching up.

Right now the magnesium price is weak, not from lack of demand, but because longer production runs combined with streamlined production techniques are improving costs, making a lower price possible. And most of the trade believes aluminum prices will go up very soon.

Most observers now feel that if aluminum companies raise their prices, magnesium will consider this enough improvement in its competitive position for a while.

But it is no secret that magnesium has been courting the automakers. When auto companies start buying more magnesium, the price is sure to drop.

Imagination — Fabricators who have taken the time to check are discovering that magnesium and a little imagination go well together. In many cases cost savings that result make a difference.

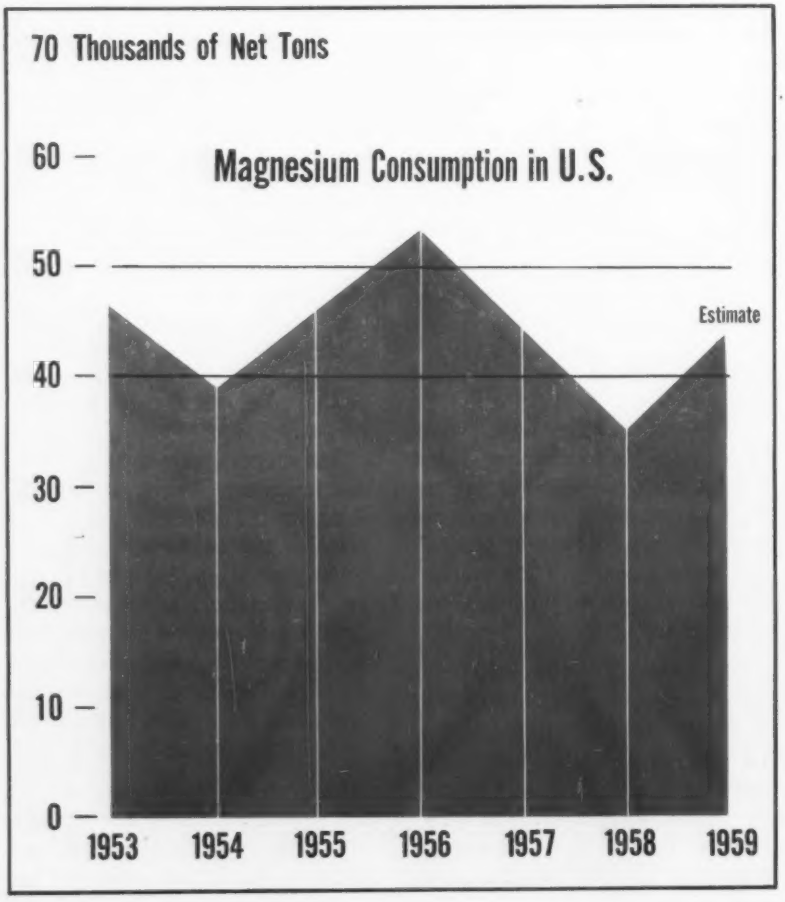
The company that fabricated the Avro Arrow jet airplane discovered it could use existing autoclave equipment to "vacuum form" a magnesium part. They taped magnesium sheet to an aluminum master, put it in a plastic bag and evacuated the air. This was popped into the autoclave where the magnesium was cured to the desired contour. (See picture.)

Welding was a problem until some aircraft companies discovered it was no problem at all with shielded arc.

Easy to Work—And magnesium's machinability gave some fabricators the opportunity to work the metal with much less expensive woodworking tools. The metal can be worked faster, and tool life is much longer.

Magnesium requires only slightly more than half the power to machine than aluminum, and less than one-sixth that required for steel, only one-tenth that for nickel alloys.

Many New Markets Ahead



Steel Strike Issues Run Deep

Dispute centers around management's desire to ease restrictions, promote freedom to change.

Companies accuse union of fighting efforts to raise efficiency.—By G. J. McManus.

▪ Steel's costly strike is shaping up more and more as a battle for a clean break with the past and greater freedom for the future.

In its earliest statements, the industry insisted it was out to shatter the tradition of automatic wage and price increases each year.

Management Means It — After weeks of negotiating and finally a shutdown, this message has started to come through. Management is not playing by the old rules, it is out to stabilize wage costs.

Still not fully recognized is the fact that a push for change runs through the whole management position. In their proposals for reforms in local practice provisions and in their whole approach to the new contract, the companies are seeking to ease restrictions of the past and promote the freedom to change.

"Change is the essence of progress," says U. S. Steel's R. Heath

Steel Management Speaks Up

This IRON AGE interview with R. Heath Larry, of U. S. Steel Corp., one of the four industry representatives who tried to negotiate a new contract with the United Steelworkers of America, spells out management's philosophy on the vital issue of its right to correct what it considers inefficient work practices.

Question: Do past practice provisions infringe on the right of steel companies to manage?

Answer: We have never consciously given up the responsibility of managing operation as efficiently as we know how. When we see an inefficient work practice, we work to correct it. But we have found after adoption of the past practice provision that the union kept pushing the idea everything had to be the way it has always been. We do not admit that the present contract prohibits method changes in existing situations. About 80 pct of the time, arbitrators uphold contested changes.

Question: Do present past practice provisions work against efficiency?

Answer: When a man finds a way to improve conditions, he knows the union will probably oppose the change. He cannot get a clear or certain answer as to how arbitrators will interpret contract language for his proposal. There is an intangible here—a frustration. We can't precisely measure how much this feeling slows progress but we do see a danger that management as well as labor could settle into frozen attitudes.

Question—If a practice is inefficient, why would management accept it in the first place and allow it to continue over a period of time?

Answer: Over the years there has been a rise in the intelligence and educational levels of steel workers and managers. As time has passed, supervisors are constantly finding better ways of doing things.

Question: How have you approached the whole problem in negotiations?

Answer: In our sessions with the union we have tried to forget contract language and get to the point where we were talking about the real intent of provisions. As an example, the words, "actual work time," were used in the agreement on duration of apprenticeship. Because of a past practice, the agreement has been interpreted to mean vacation and layoff time will count as part of the apprentice period. We think it's time the contract was supplemented at least by descriptions of its original intent.

R. Heath Larry

Question: Doesn't the existing contract call for real union support of efficiency measures?

Answer: Labor, generally, will agree to a broad endorsement of efficiency. It will assert, outside the contract, that the contract does not protect loafing. But the unions object to specific clauses that make clear there is no protection of unjustifiable idle time.

Larry, a member of the industry's four-man negotiating team.

Forget the Past—Mr. Larry told The IRON AGE of attempts by company negotiators to get new consideration of contract provisions affecting efficiency.

"In our sessions with the union, we have tried to forget contract language and get to the point where we were talking about the real intent of provisions."

Union's Attitude — According to Mr. Larry, the union response was simply that any change would be a backward step.

Some of the specific restrictions were discussed in the final pre-strike exchange. United Steelworker chief David McDonald denied labor was holding back progress but said the union would write formal support of technical advance into contracts.

The Real Issue—The companies rejected the offer, saying the issue was not whether new equipment could be installed but whether management could improve work practices in existing situations. In these situations, say the companies, the union resists changes involving "adoption of different methods, reassignment of duties and elimination of unjustifiable idle time."

Most of this resistance comes under the past practice provisions of contracts. "In the grievance procedure it is almost automatic for a union to include Section 2b in its statement of sections of the agreement violated," said Thomas E. Ricca last year. Mr. Ricca is an attorney for Jones & Laughlin.

A Bugaboo—He went on to say: "Past practice has been held binding in: the method of assigning overtime, the choice of turns, the assignment of particular classifications of employees to do certain work, relief periods, washup time, the size of crews and many others, all of which are direct limitations in the flexibility of operating the business."

How severe are these limitations? Mr. McDonald ridicules the whole idea, saying it is inconceivable that a local working condition could prevent a settlement.

Mr. Larry does not feel there is a simple answer.

Danger Foreseen—"When a man finds a way to improve operations, he knows the union will probably oppose the change. He cannot get a certain answer as to how arbitrators will interpret contract language for his proposal. There is an intangible here—a frustration. We can't measure how much this feeling slows progress but we do see a danger that management as well as labor could settle into frozen attitudes."

A top industrial engineer for steel points out that such a freeze would take much of the steam out of industrial growth.

It Takes More Than Machines—"The big gains of the past 50 years have not come just from better machines," he contends. "They have come in large part from measure-

1959's Union-Management Crisis

Facts in Steel Strike

When It Started: At midnight Tuesday, July 14. It involves some 500,000 workers in basic steel plants, iron ore mines, and other operations.

Why It Started: Failure of steel companies and United Steelworkers to reach agreement on a new contract. The old contract expired at midnight June 30 but was extended two weeks at the request of President Eisenhower.

What's at Stake: The Union demands wage and fringe concessions worth about 15¢ an hour. It also wants continuance of the cost-of-living escalator clause which in three years put 17¢ an hour in workers pay envelopes.

The steel companies take this position: Extend the old contract for one year at present wage rates and eliminate the cost-of-living clause, freezing the 17¢ into base pay rates. They have also offered to consider some fringe concessions this year and a "modest" pay rise in 1960 in a two-year pact, providing the union agrees to changes in local working rules to permit money-saving plant efficiencies. The companies imply that under either condition, prices will not rise.

What It's Costing: Assuming a steel operating rate of 70 pct had there been no strike, the walkout is costing about 1.5 million ingot tons of steel each week. This takes into account the fact that companies representing about 15 pct of capacity continue to operate (see page 100). In dollars, the loss to the companies is about $200 million a week, to the workers about $50 million. About 35,000 workers in allied and servicing industries were laid off in the first week of the strike.

Where Steel Users Stand: Steel users added 10 million tons to inventories in the first half. User stocks stand at 23-24 million tons, or better than 100 days' of supply—if stocks were in balance. Since they are not, some users will feel the pinch in 4 to 5 weeks. A few will be hurt even before that.

What Local Practices Issue Is All About

As a prerequisite to granting even minimum economic concessions to steel labor, the steel companies have insisted that the union agree to changes in contract language covering local working conditions.

Specifically, the companies are fighting for the right to make changes in the interest of plant efficiency without being hamstrung by precedent-setting past practices and contradictory language.

Here are some of management's demands in this area and why it feels changes are long overdue:

What Management Wants: "Modify ambiguous and restrictive language so as to enable management to make operating improvements in the interest of greater efficiency and economy."

Why It Wants It: The now-famous Paragraph 4 of Section 2-B covering local working conditions first gives management the right to change or eliminate local working conditions, but in the next breath it all but takes it away.

This ambiguous wording, plus the effect of precedent-setting past practices, has led to endless grievances and arbitrations that have delayed or frustrated management's attempt to make changes to raise plant efficiency.

What Management Wants: "Add provisions which will reinforce the contract prohibition against wildcat strikes, slowdowns, and picketing."

Why It Wants It: Says Inland Steel Co., "Despite the no-strike provisions in the present agreements, as well as the peaceful procedures specified for the settlement of grievances, the record is clear that in the last three years some steel workers have chosen to violate the provisions of the agreement. . . . In fact there have been several hundred wildcat strikes during the period. . . ." The companies propose penalties of a loss of a day of vacation pay and of one Supplementary Unemployment Benefit credit for each day an employee participates in a wildcat strike.

What Management Wants: "Recognize the function of management to develop incentives and establish sound standards."

Why It Wants It: A Midwestern steel mill cites an experience of last December when it installed an incentive plan covering a new machine. Experience proved the incentive rates were more than generous, that workers could easily earn 130 to 140 pct of their base rate. But when the company sought to bring the rates into line, the dispute blew up into a wildcat strike that cost three days' production.

What Management Wants: "Clarify the right of the companies to change work schedules so as to meet the changing requirements of the business."

Why It Wants It: U. S. Steel Corp. this year lost an arbitration case that arose when it sought to eliminate a weigher from an open hearth and let a mixer operator handle the job in addition to his regular duties. Only four of 11 open hearths in the shop were in use. Arbitrator Sylvester Garrett held the weigher could not be eliminated despite the reduced level of operations, as **prior practice** indicated the weigher was, he felt, necessary.

ment of work and the systematic devising of better methods."

From 1947 through 1957, the steel industry spent nearly $10 billion for new and better machines. Invested capital of the mills more than doubled.

Steel Productivity Lags—In the same period, output per manhour in steel rose something like 30 pct. In the same period, output per man increased more than 60 pct in coal. In a slightly longer period, cigar-making showed nearly a 100 pct increase. Even the railroads show a greater increase than steel.

The steel companies have gone to some lengths to explain how unreliable output indexes are as a measure of real productivity. But even assuming the indexes are not inflated, steel's production gain has been fairly modest in relation to capital spending and to progress in other industries.

Wasteful Practices—Certainly it is not hard to find examples of wasteful practices. An air conditioned crane carries an extra man because of a practice established before the cooling system was applied. An openhearth third helper is making nearly $30 a day under a runaway incentive plan. At Fairless Works, which was built after the cutoff date in the company's contract on past practices, a grievance involving reduction in crew size is now being arbitrated. The complaint is based on past practice.

Past practices were not specifically named in reform proposals. However, the doctrine of binding past practice is basic element of most contract areas.

Other Strike News

Who's Still Operating—A rundown of steel mills still operating despite strike. On page 100.

Prospects for Settlement — The issues are basic. This could be a long strike. See page 102.

Beryllium Out in Front

HANDLE WITH CARE: A beryllium billet five in. thick, 62 in. diam. is placed in a forging press operated for the Air Force by Aluminum Co. of America. The finished part will be built into the first manned space capsule by McDonnell Aircraft Corp. Its function: "Heat sink," or shield. It will be the capsule's leading edge when it re-enters the atmosphere at 18,000 mph. It will have to dissipate tremendous heat.

$5 Million for Farm Equipment Research

International-Harvester is betting a $5 million research lab that farm equipment is one of America's strongest future markets.

The truck and farm equipment builder will devote 455,000 sq ft entirely to tractor and farm equipment research. The facility boasts 10 engine test cells, and will have two more just for liquefied petroleum engine testing.

Equipment — Full scale equipment (the lab can actually manufacture just about anything it has to test) will be tested over temperature ranges of 125°F to —65°F under operating conditions. "Bump" test equipment is big and husky enough to shake apart a threshing machine or the heaviest farm tractor built. Plowing equipment can be tested indoors under controlled soil conditions.

Is the farm equipment outlook good enough to merit this kind of full-tilt research outlay? International-Harvester spent $15 million for farm equipment research last year. The new lab is aimed to boost equipment ratings much higher, and sales along with them. For instance, the heaviest tractor the firm builds is rated at 90 hp. (Don't compare this with your car. This is tractive power, and enough to pull that car apart.) The new engine test cells can test engines of 200 hp, operating at 6000 rpm.

Advancing — From an industry that appeared to be dying on the vine in the mid-1950's farm equipment has emerged with design advances that expand its markets yearly. Tractor production hit a low of 230,000 units in 1957. The industry expects to be building an average 300,000 units per year by 1960; 445,000 units per year by 1965; 450,000 units by 1970.

What about the danger from imports? Tractor men don't blink an eye. All nations need farm equipment—many of them desperately. It'll likely be built by American know-how, American capital, in plants abroad.

Westinghouse Expands

A $25 million expansion and modernization program was announced by Westinghouse Electric Corp. for its turbine, generator, large motor, and related heavy apparatus facilities.

Largest share of the money, $21 million, will go into the company's steam division at Lester, Pa., where capacity will be increased by one-third. The remaining $4 million will be used for expansion at the East Pittsburgh, Pa., and Sunnyvale, Calif., plants.

More Oxygen Steel

A 500-ton-a-day oxygen plant will be built at Great Lakes Steel Corp.'s Ecorse, Mich., site by Linde Co., division of Union Carbide Corp.

About 80 pct of the oxygen produced will be used to speed open-hearth steel production, 10 pct will be used for mechanized scarfing, and the remainder will supply other finishing and general maintenance.

Four smaller oxygen plants with a combined capacity of 100 tons a day have been in use at Great Lakes Steel for several years.

New Steel Record

Shipments of finished steel products from steel mills during May 1959 set a new record, the American Iron and Steel Institute reports. The total of 8,754,119 net tons was about 150,000 tons above the former record set in April.

During the first five months of 1959, shipments totaled 38,219,140 net tons, a rise of 66 pct from the same period last year. But it was below the record 38.8 million tons shipped during the first five months of 1956.

the sales-making gleam of Superior Stainless STRIP STEEL

At Chrysler Corporation, fine automotive engineering and fine motorcar appearance go hand-in-hand. That's why Chrysler specifies *stainless steel* for essential exterior brightwork where beauty must equal performance, year after service year. ● For over 25 years CHRYSLER has been a regular user of quality stainless strip steel from the mills of Superior Steel—a privilege and responsibility we are happy to uphold.

SUPERIOR STEEL DIVISION
OF
COPPERWELD STEEL COMPANY
CARNEGIE, PENNSYLVANIA
For Export: Copperweld Steel International Company, New York

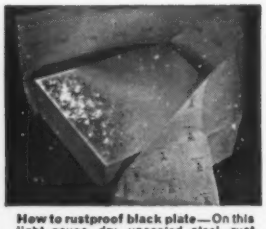
how to rustproof cold rolled steel in shipment and storage

Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For a interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 180 North Wabash Ave., Chicago 1, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.



How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®
by Cromwell

For over 38 years—
"Paper Engineers" for Steel

Is Business Nearing the Peak?

There was little indication that the boom was running out of steam when the steel strike deadline was reached.

The FRB Index of Production hit another new record in June and most indicators were still on the uptrend.

▪ Industrial production hit another new record in June, for the fourth straight month of record breaking. The question now is how long this new record will stand.

If the steel strike extends longer than a month, its end may bring a quick revival of production to record levels. But disregarding the strike for a moment, is business approaching a plateau?

Momentum Still Building — On the face of it, there is little in evidence to indicate a plateau now. There is some water in the economy, mostly in steel inventories, but not a great deal.

Right up through June and into July, the output of cars, household durables, and business equipment continued to expand, according to the Federal Reserve Board. And so did the major non-durables, including textiles, apparel, paper and chemical products, all reflecting the overall strength of the economy.

Production Soars—There was no letup in business momentum as the FRB's Index of Industrial Production soared two points in June to its new peak of 155. That put the Index a full 23 points over a year ago and 8 points above the pre-recession high that many thought would stand for years.

But at the same time, there are a few factors that bear watching. One is that construction is gaining less than seasonally. Another is the determination to put the squeeze on money supply. A third factor is the end to inventory rebuilding.

Strike Effects—A prolonged steel strike, of course, will dominate the economy. There has been a lot of talk of three months' stocks and most users are not outwardly concerned about a strike of some duration. At least that's what they say.

But a key industry does not shut down without hurting the economy. Add to the steelworkers all those in industries supplying the steel industry with materials and services, and the total of people affected reaches serious proportions.

Most businessmen will do well to hold their breath until the steel crisis is settled, then take it from there. Remember, all available statistics today were compiled before the steel strike deadline. So were surveys of intent. What happens now will determine future events, not attitudes and orders that prevailed before last week.

Management Asserts Its Rights

▪ You can expect a general stiffening of industry's attitude on its right to manage. And management will insist in its rights to utilize equipment to gain maximum benefits.

It's a trend that has been building up for several years. Even companies that went to great lengths to avoid trouble in the shop are coming around to that philosophy.

Lived With It—Many companies for years have "lived with" situations that kept them from obtaining full results from expenditures that they made to cut costs and to improve production.

It has reached the point where it goes deeper than merely avoiding labor trouble. Companies that yielded their management prerogatives are in tough competitive positions. Many have gone under for just that reason.

Consumers Pay—They have an added assist in their efforts. The public is no longer unsympathetic to a company's efforts to assert its rights. Consumers know that they are paying for featherbedding and other inefficient practices. They are supporting company efforts to operate efficiently, even at the expense of labor troubles.

Many people believe steel bargainers missed the boat in not stressing what they are up against in "local practices." But it may not be too late and certainly others will benefit.

Material Handling Orders Climb

An indicator on the plus side: Orders for material handling equipment are at the highest level since August, 1956.

This bears out earlier indications that capital spending is on the upgrade as manufacturers are determined to pare operating costs and improve efficiency.

The Material Handling Institute says that orders in May were 11 pct over the April level. It was the fifth consecutive month in which orders for material handling equipment climbed.

This is all the room you need to weld with LINDE's "MIGHTY MIDGET"

SHOWN ACTUAL SIZE IN 3-IN. OPENING

. . . New Heliarc HW-20 Torch

HIGH CURRENT CAPACITY

Operates at 200 amperes *continuous* duty, AC or DC. Molded, totally closed water-cooling system eliminates any chance of leaks at torch head.

MINIATURE SIZE

9/16- by 2-5/16-in. torch head permits welding in hard-to-reach areas as small as 3 in. in diameter. Total torch length is under 7 inches.

3.3-OZ. FEATHERWEIGHT

Selected materials, such as glass fiber reinforced phenolic plastic, save weight without sacrificing strength. Torch (with short cap) weighs only 3.3 ounces.

HANDLES LIKE A PENCIL

Exceptional balance, light weight, small size, and super-flexible service lines make the HW-20 torch as easy to handle as a pencil.

For further information, call your local LINDE Office or LINDE Distributor . . . or write: Dept. I-073, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, New York.

SPECIFICATIONS

Capacity—
200 amp. AC or DC, continuous duty cycle;
225 amp. AC or DC, reduced duty cycle

Weight—
with short cap: 3.3 oz.*
with medium cap: 3.5 oz.
with long cap: 3.6 oz.

Length overall—6⅞ in.

Length of Torch Head—
with short cap: 2-19/64 in.*
with medium cap: 3-9/32 in.
with long cap: 7-5/16 in.

Maximum Handle Diameter—¾ in.

Maximum Head Diameter—9/16 in.

Service Lines—12½ or 25 ft.

*Torch is supplied with medium cap for 3-in. electrodes. Short cap for 2-in. electrodes and long cap for 7-in. electrodes are available as accessories.

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The terms "Heliarc," "Linde," and "Union Carbide" are registered trade marks of Union Carbide Corporation.

AN IRON AGE SPECIAL REPORT TO MANAGEMENT

How to Translate Field Failure Into Product Improvement

Properly analyzed, reports on field failures can be a company's most valuable information.

Lower costs, better products result from lessons learned from the field.—By K. W. Bennett.

▪ Take a long look at your customer service department. The reports it receives on "field failure" of your product can be the most valuable information coming into your plant.

Properly used, these reports can point the way to many economies and benefits. They can help cut sales costs. They can trim inventory costs. They can slash inspection costs. And they'll boost your customer rating and sales.

Records Prove It—Rheem Manufacturing Co., after a two-year analysis of its intensive use of customer service reports, has this to say:

"Manufacturing defects, complaints originating within 90 days of installation, were related to the dollar value of equipment on which complaints occurred. The first two years of the program show an average yearly reduction of 12 pct per year in the dollar value of manufacturing defects.

"Using the same year as a base, but compiling data on the number of complaints—rather than on dollar value—even larger gains have been made in two other areas.

"Within-plant complaints, such as rejection of parts on the assembly lines, or return to the various departments for rework, have been reduced through two years, with an annual average of 16 pct per year.

"On the same basis, field com-

Quality Control Goes Into the Field

CUSTOMER SERVICE TEAM: Field failures are turned into assets at Rheem Manufacturing when reports are analyzed and applied to plant operations. R. E. James, right, analyzes field reports at the staff level. George Landis, left, quality control chief, applies results to operations. How system works out, from complaint through manufacturing improvement, is shown on following pages.

plaints — difficulties encountered later than 90-days after installation —have been reduced during the two-year period by an average of 19 pct per year."

Hush-Hush—During this period production climbed as sales gained.

The speaker is Vearl Heinis, vice president and general manager of the Home Products Div. of Rheem. The figures are startling. They come from a company with a top reputation for quality and manufacturing knowhow. The speaker is a working V. P. who knows his job, and his plants. He's speaking frankly on a topic many companies prefer not to discuss. But the subject is hot enough that most major companies are tightening up their field service reporting system, widening their programs.

Team System — Rheem's Water Heater Div. recently installed a two man team as its customer service department. George Landis heads up quality control at Rheem-Chicago plant. He works with manufacturing and inspection, examining plant operations in the light of customer service data flowing in from Rheem field service men, or from customers themselves.

His teammate is R. E. James, who operates at staff level. His job: Analyze the incoming data on complaints. He'll watch for trends. Mr. Landis will get complaints data to sales, to management, to Rheem men in the field.

Rheem, along with other companies who are expanding their use of such information, put one man at staff level, and one at operating level.

From Failure to Production—In all cases, they break down reports of field failures in detail. Failure of an individual part in, say, a refrigerator is established by geographic location, type of failure (factory defect, faulty installation at the point of use, part damaged in transportation from the factory to the point of installation), and by model or number.

How the system is followed through from field failure to design and production changes is shown in picture story, below.

I-H Program—At International-Harvester, Motor Truck Div., daily reports on any field failures of a part are mailed in to the service department. About 170 field service offices supply the data. These are analyzed by the service department immediately. All of the above information is tabulated. Copies of each complaint go immediately to manufacturing, and quality control.

A monthly meeting is held at the Engineering & Research Center. Prior to the meeting, service department reports failures by general part classifications, geographic locations, terrain type, any parts that fail to meet warranty life, and the

Step by Step, From Failure to Improvement

Field Failure Analyzed

PLANT TEST: Failure is given full test on return to Rheem Manufacturing plant. Data will serve as basis for further investigation and will determine what steps should be taken to avoid recurrence.

Design Change Studied

ON THE DRAFTBOARD: Analysis of customer data can serve as a basis for design changes that will lengthen product life. Above, Mr. Landis confers with design engineer on possible change.

type of failure. Representatives of manufacturing, engineering, and sales go over these reports to spot any developing trouble spot.

Norge Follow-Up — At Norge Division of Borg-Warner, a consumer complaint is answered with a personal letter. At the same time, complaints are analyzed for much the same data described above. A monthly meeting at each company plant involves manufacturing, customer service, top company management, quality control, and sales representatives.

The minutes of the previous monthly meeting are re-checked, and corrective action that was taken is reported.

Spare Parts Economies — Clark Equipment Co., another pioneer in the complete use of customer service data, used its findings to revamp its entire spare parts distribution system. This company knows the average life of each part in, say, a fork lift truck. When a Clark dealer sells a fork lift truck, this is immediately noted against his estimated future spare parts requirements. Using the dealer sales, plus data on the expected life of each part in that fork truck, Clark can ship dealers an optimum inventory.

Using this system, Clark reduced its spare parts depots from four to one. Each dealer receives a bulk weekly shipment. Inventory carrying costs are cut, order expediting costs are slashed. Parts can be shipped in bulk and transport costs are reduced.

Analyzing field failures can have many by-products, if results are put to good use. Here's a list of some of the things that can be done.

1. Spare parts requirements can be projected for a model change. This can be done as far as two years ahead.

2. Spare parts inventory levels and production schedules can be projected, based on sales forecasts.

3. Accurate cost figures for "Guaranteed Maintenance" contracts can be developed, where the manufacturer guarantees to maintain equipment at a fixed price for several years after purchase.

4. Economic warranty life can be established.

5. Optimum dealer stocks of parts can be developed.

6. Probable field failures on a new model can be projected within a fraction of a percentage point soon after they are introduced.

7. A better degree of in-plant quality control can be obtained with a smaller inspection force.

8. Exact cost of customer complaints can be determined.

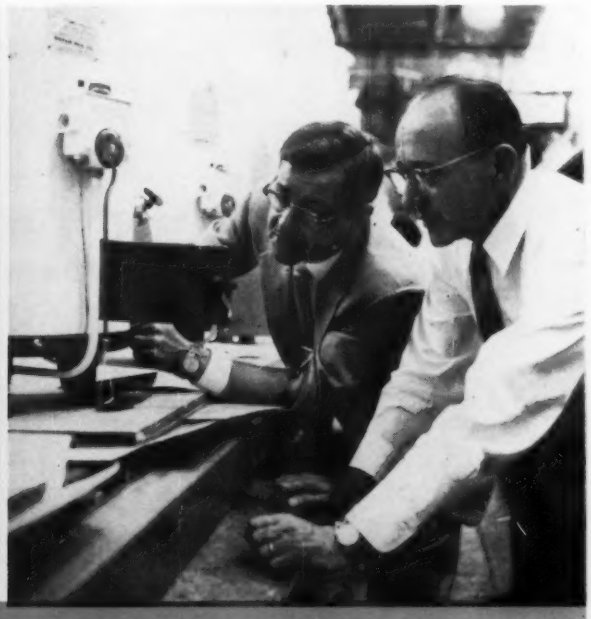
9. Defects in products can be quickly detected and where they are originating can be determined.

10. The entire plant can be made aware that "good quality must be built in—not 'inspected in'. . . ."

New Model Tested

PILOT MODEL: A pilot model of a new Rheem water heater is put through intensive tests in company laboratory. Object is to add additional safety factor to existing quality control measures.

Production Methods Checked



ON THE LINE: Final step is to translate field reports into actual production improvements or economies. System has reduced number of inspectors even while production rates were increased.

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Weight-Cutting Trend Rolls On

Heavy-Duty Truck Builders Use More Fiberglass, Aluminum

Larger payloads are just one selling point for the new, lightweight tractors.

But they also offer lower tooling costs to truck builders.—By H. R. Neal.

▪ Lightweight materials are invading the truck market in a big way and the trend is really just beginning. In recent months White Motor Co. has introduced several heavy-duty truck tractors that are every bit as rugged as their predecessors, but weigh hundreds of pounds less.

"Interest is growing in these additional payload producing trucks by leaps and bounds," according to the company. "It is conservatively estimated that within one year 25 to 50 pct of The White Motor Co.'s sales will be in lightweight vehicles." (In the first six months of this year White's output was about 10,184 units, 1100 more than the 1958 period.)

Combination of Materials—Aluminum and fiberglass are being used to achieve substantial savings in weight—and the weight savings are being translated into added cargo for truckers.

One new White series, the 5000, is a tilt-cab model. The cab body is made entirely of fiberglass reinforced with aluminum at critical areas. The body, made by Molded Fiber Glass Body Co., Ashtabula, O., contains 36 fiberglass parts bonded together into an integral unit.

Quiet and Comfortable—Besides the lighter weight, a number of other advantages are claimed for the fiberglass body. Natural insulating characteristics of the material make the cab warmer in the winter, cooler in the summer. Its acoustical properties reduce noise, thereby reducing the driver fatigue.

Fiberglass is rustproof. It's also impervious to salt and road chemicals, qualities which reduce outlays for upkeep. And the material is tough, impact resistant. If damage should occur, it is easily repaired. The tractor cab is only 50 in. from bumper to back of cab, allowing use of longer trailers, and it provides a weight savings of up to 1250 lb.

The White 4400TDL, a diesel power tractor with the engine forward of the cab, weighs up to 2260 lb less than similar tractors of conventional material. Liberal use of aluminum for components, coupled

Engine Block of the Future?

DIECAST ALUMINUM: A. F. Bauer of Doehler-Jarvis Div., National Lead Co., examines section of diecast aluminum engine block for which he was granted a patent. Weight for average V-8 diecast block would be 55 lb, compared to over 200 lb for conventional gray iron block.

with fiberglass for fenders, accounts for the reduced weight.

Then There's Cost—Lighter weight, however, produces cost penalties in production — and they're high. White says each pound of weight saved costs an additional $1.

But the higher cost is more than offset by the added revenue produced by higher payloads, says the company. "Increased payloads will pay off the additional investment within the first year of use. Additional payload in ensuing years is gravy."

"A Pound Saved" — The firm points out, for example, that with a typical heavy rig, gross vehicle weight can be cut by as much as 5260 lb by using a 4400TDL tractor and an aluminum body trailer. Each lightweight rig (tractor and trailer) will earn an extra profit of $5260 per year. White obtained the figures from contract haulers who figure on a revenue of 5¢ per ton-mile. In other words, "a pound saved is $1 earned" is the rule of thumb formula used to figure the added annual value of each extra pound of freight.

When running empty, reduced vehicle weight means longer tire life, less fuel consumption and less wear and tear on the chassis. Engines last longer between overhauls and use less oil and other lubricants.

Tooling Costs Less — Fiberglass offers cost savings advantages for the manufacturer as well as the trucker, according to a representative from the Molded Fiber Glass Body Co.

While the per-unit cost is higher than for a steel body, the tooling costs are substantially lower. This is important when considering the fact that the production volume of large truck tractors is still relatively low.

Molded Fiber Glass estimates tooling costs for the White cab at about $500,000, and between $2 to $3 million for a comparable steel cab. Besides more rapid amortization, the lower cost permits greater flexibility in providing special models.

Tailored for Turnpikes — White has already placed a tandem-axle version of its Model 5000 in service. The new tractor is specifically engineered for tandem-trailer operations on the New York and Massachusetts superhighways where it pulls one 35 ft trailer and two 17 ft containers on another 35 ft trailer chassis.

Turnpike authorities in the two states are cooperating in an experiment permitting extra long tractor-trailer combinations on the toll-roads. New York permits rigs up to 98 ft in length on its superhighway. For regular roads the maximum length allowed is 50 ft, and in Massachusetts it is only 45 ft.

If the experiment is a success, it could mean lower cross-country shipping rates.

Automotive Production

WEEK ENDING	CARS	TRUCKS
July 18, 1959*	127,546	27,675
July 11,1959	123,147	25,706
July 19, 1958	85,533	16,187
July 12, 1958	73,062	15,036
TO DATE 1959	3,595,421	723,548
TO DATE 1958	2,427,310	483,036

*Preliminary Source: Ward's Reports

The Bull of the Woods

I'VE BEEN OUT OF MY APPRENTICESHIP A YEAR NOW, AND I'M MARRIED AND THERE'S A BABY COMIN' AND----
HA-HA! THAT'S GOOD! TH' OLD BULL O' TH' WOODS KNOWS WHEN A GUY'S TRAILIN' HIM FER A RAISE AN' HE ALWAYS STOPS BY SOME NOISY MACHINE OR MOTOR SO THEY CAN'T BE HEARD--BUT THAT GUY IS CLEVER!
TOO CLEVER-- HE FORGOT THAT IT'LL TAKE THE BULL TWO YEARS TO SEE THE FUNNY SIDE OF THAT!
THE WISE GUY
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Detroit Briefs

Ford Plans Small Truck—Ford Motor Co. designers are busily at work on a line of small trucks similar to Volkswagen's Microbus line. It's being referred to as the Econo-Line.

Olds Air Conditioning—Oldsmobile reports its factory installed air conditioning sales for the 1959 model year (through June 30) exceed those of any other company. Olds installed 50,924 units—16 pct of total vehicle production.

Quality Audit Report — Ford's Quality Audit Program has worked so well the company is having a hard time getting parts past the keen eyes of inspectors. Engineering is now spending $275,000 and working seven days a week to go over 1960 model prints and ease tolerances where they aren't critical.

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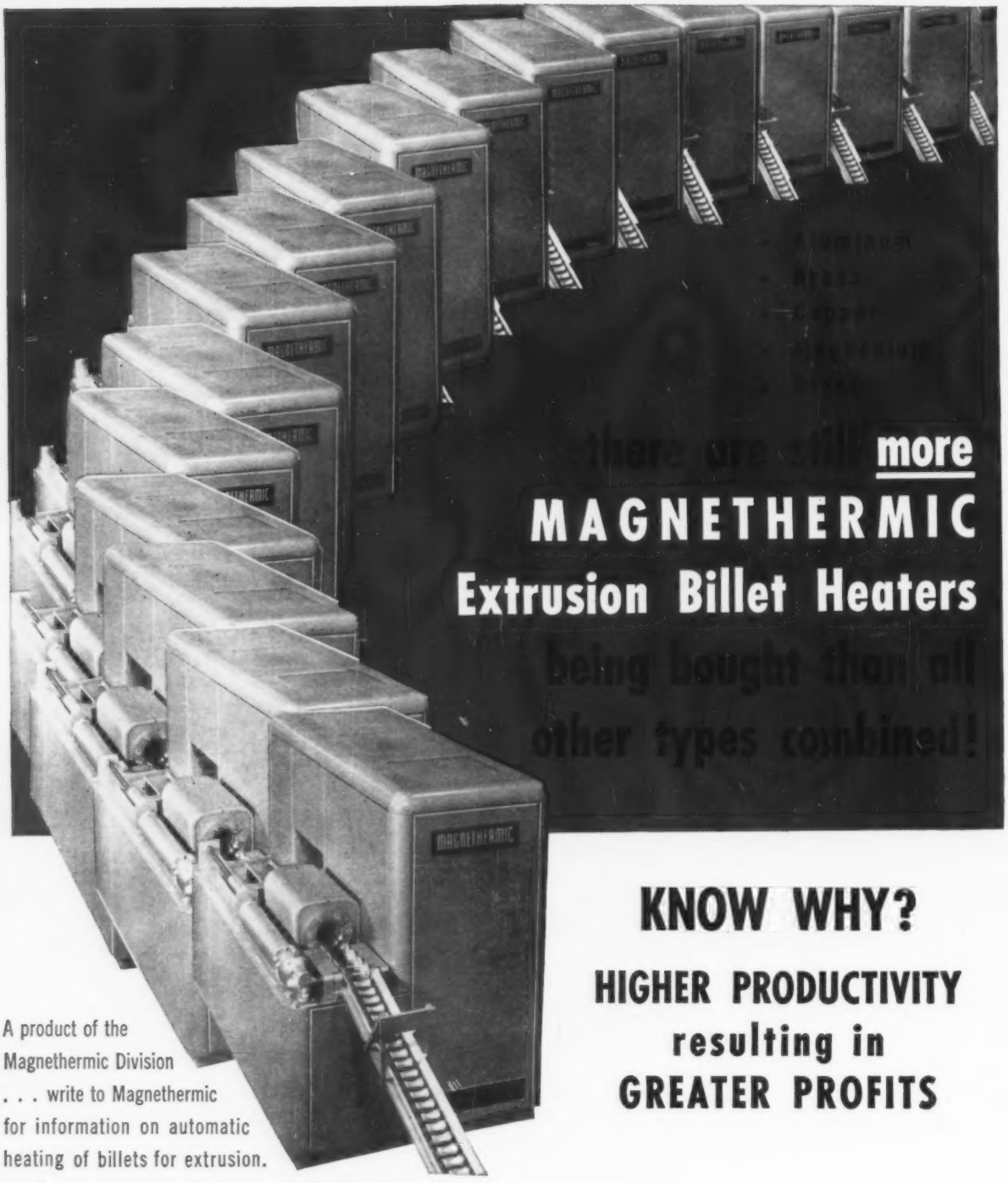

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Ike's Out to Block Inflation

His Drive Is Getting Heavy Public Support

The Cabinet and White House staff have their orders: Crusade against inflation.

It's working as Congressmen report heavy mail in favor of holding down federal spending. —By G. H. Baker.

▪ Ike's hard-hitting drive against creeping inflation gathers speed.

Every member of the Cabinet and of the White House staff has his orders: Be a zealous crusader against further dilution of the dollar. The drive is arousing voters to indignant action; congressmen of both parties report unusually heavy mail these days in favor of holding down federal spending.

Podium Pounder—In a recent fire-breathing speech in Dallas, Ike's Cabinet secretary, Robert K. Gray, declared bluntly that the nation's progress can be ended by the "triple threat combination of deficits, debt, and inflation."

"We can build the strongest military protection imaginable with missiles and weapons of every description," he declared. "But we can lose the economic contest with Communism by weakening our credit, our currency, and our free-enterprise system in the sight of the world."

Take Heed—Watch out for these questionable assertions, Mr. Gray warns:

"A balanced budget is a 'horse-and-buggy' approach, discredited since 1932."

"The national debt need never be paid because we owe it to ourselves."

"A little inflation would do more good than harm."

"Government can go on spending without it's costing anybody anything."

Every one of these fallacies is at the root of the doctrine of "Buy-now-pay later" spending schemes now before the Congress, he observes.

What to expect: Inflationary trends are still in the making, but aggressive White House action is taking much of the steam out of upward pressures. Advances in costs and prices will come, but they'll be greatly restricted.

Gas Tax Hike Likely

The Eisenhower Administration may be partly successful in its bid for a higher federal gasoline tax.

It is still unlikely Congress will vote the complete 1½¢-per-gallon increase requested. But the lawmakers may approve a lesser increase, with a definite cutoff date, to keep the federal highway trust fund in the black.

Opposition Wavers — Until recently, key Democrats in Congress objected strongly to a gas tax boost as a solution to highway financing troubles. Now, even the highly-influential House Speaker, Rep. Rayburn (D., Tex.), appears to be wavering in his opposition to the higher levy.

Results of public hearings opened by the House Ways and Means Committee on July 22 will indicate what will happen to the gas tax. This tax-writing committee is gathering testimony on all aspects of highway financing. Committeemen are interested in discussions of both short-term and longer-range plans for paying the roadbuilding bills.

Scheduled to testify are spokesmen for the Treasury Dept., Commerce Dept., and Bureau of Public Roads. All are for a gas tax rise.

We Can't Keep Secrets

Ask Congressional Stopper — Congress is being urged to plug leaks of industrial secrets to potential enemies.

Recently, the Supreme Court threw out the Pentagon's security check-ups of defense workers. The high court declared personnel probes illegal, stating that military investigators were exceeding their authority.

Since then, the Defense Department has been powerless to prevent security information from leaking out of defense plants.

Spy Protector—Rep. Frank T. Bow, (R., O.) claims Pentagon officials know of 2000 defense workers who now carry out secret missions for potential enemies.

But these workers can't be fired, under Supreme Court ruling.

Mr. Bow is one of a group of congressmen urging fast enactment of an air-tight screening program for defense workers to replace the one struck down by the Supreme Court.

New concept in productivity...

Brown & Sharpe Model B Turret Drilling Machine...

DIGIMATIC† Model 202 Point-Positioning System

. . . combine to give you the lowest-cost complete tape-controlled turret drilling system for:
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- New freedom in designing
- Engineering changes effective immediately (change tape, not tooling)
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- Lead time and tooling costs cut drastically
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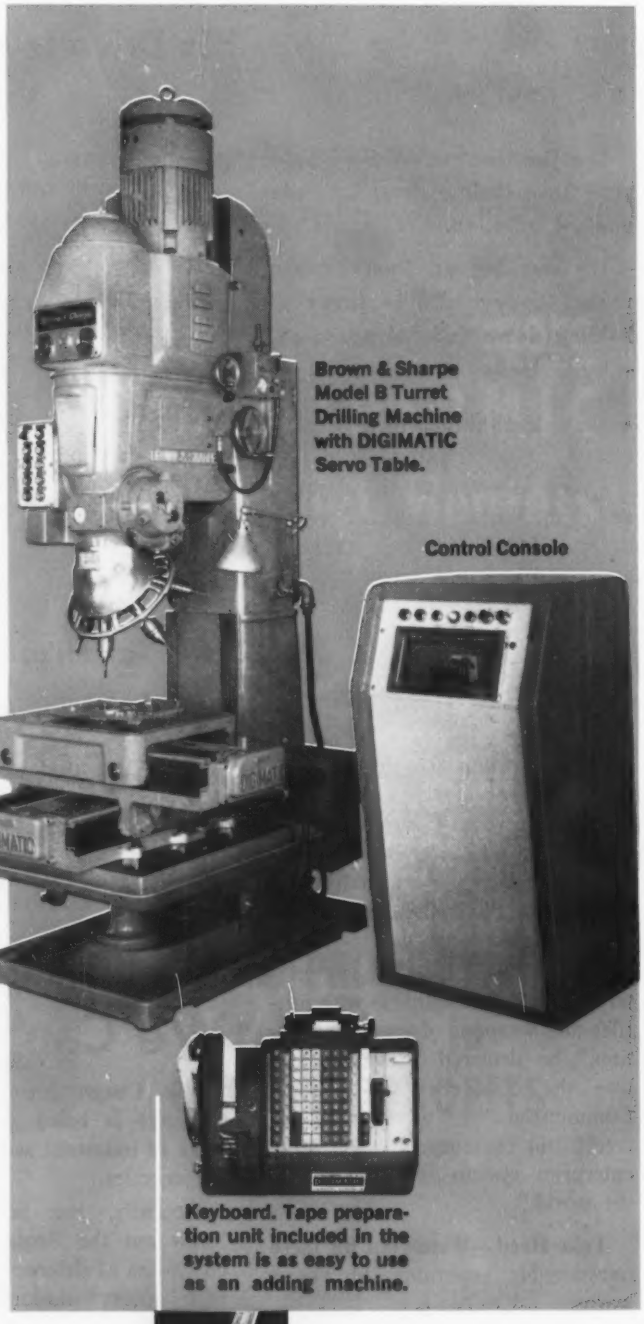
ASK US TO ARRANGE A DEMONSTRATION WITH YOUR BLUEPRINT AND YOUR PART. Write for the free booklet, "DIGIMATIC Model 202 Point-Positioning System." Also: movies shown at your plant or shop on request.

†DIGIMATIC is our trademark.



Brown & Sharpe Model B Turret Drilling Machine with DIGIMATIC Servo Table.

Control Console

Keyboard. Tape preparation unit included in the system is as easy to use as an adding machine.

Tooling With Tape

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ADVANCED DESIGN: New type Terrier antiaircraft missile rockets from its launcher in test firing. Improved Convair-built weapon will double effectiveness of Terrier defense against air attack, Navy says.

Farwest Banks on Military Work

As the U. S. pushes missile-making, the West Coast's military backlogs will grow.

Five of top ten defense contractors, including the largest—Boeing—headquarter there.—By R. R. Kay.

▪ When the government's fiscal 1959 figures are out, it's a very good bet West Coast companies will show up with even bigger military backlogs.

The Top Ten—Just take a look at the Defense Dept.'s 10 top contractors for fiscal 1958:

(1) Boeing Airplane, $2.1 billion; (2) General Dynamics, $1.3 billion; (3) General Electric, $783 million; (4) Lockheed Aircraft, $755 million; (5) United Aircraft, $661 million.

(6) American Telephone & Telegraph, $659 million; (7) North American Aviation, $647 million; (8) Douglas Aircraft, $513 million; (9) Hughes Aircraft, $472 million; (10) Martin, $400 million.

Five on the Coast—The significance is easy to see. Boeing, the No. 1 giant, is based on the Coast. So are four more: Lockheed, North American, Douglas, and Hughes.

Two others have major divisions there: General Dynamics' Convair at San Diego and Pomona, and Martin at Denver. The rest have important facilities in Farwestern states.

Boeing and General Dynamics alone held 16 pct of the dollar volume of 1958 military contracts.

More Work Ahead—Catching up and beating Russia in missilemaking is the nation's goal. To do this, Pentagon planners insist they'll need more and more money for missiles as the years go by.

Simply stated, this means the Farwest will strengthen the dominant spot it now holds.

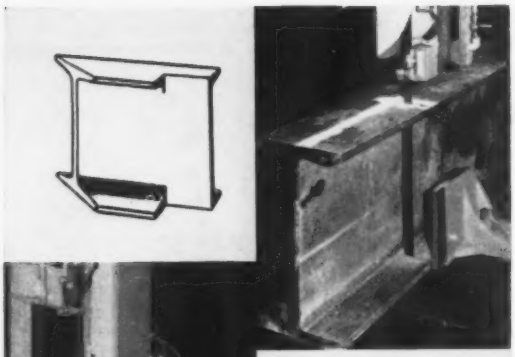
Why Washington State Worries

Two hundred thousand jobless persons in the State of Washington. That frightening prospect could face the area.

"If complete peace could be attained, it would mean the immediate loss of that number of jobs here." So says Dr. Stanley E. Crook, research director, Washington State's Dept. of Commerce and Economic Development.

Cause for Concern — The state owes its economic good-health to military business. But it's plenty worried about it. About 40¢ of every dollar that comes in is federal spending.

Dr. Crook urges his state to diversify its industries.

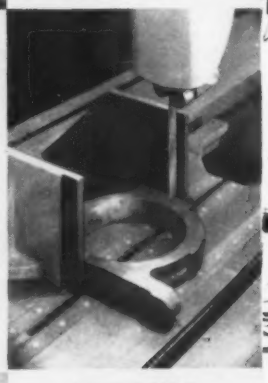


COPING AND MITERING HEAVY STRUCTURAL SHAPE

18" Beam (above) is held between vises for the short cut. On the long cut (left) vises were removed and beam held by simple clamp. The MARVEL Band Saw is truly indispensable in ornamental and structural iron shops where this type of work is done daily. The machine will cut-off square, miter and cope any work shape from the smallest moulding to 18" I-beams.

SPLITTING CLAMP RINGS, BUSHINGS

Splitting clamp rings, connecting rods, bushings and collets is a fast, simple operation on the No. 8 Band Saw. Perfect control, quick chucking facilities, accuracy and speed are features that especially fit the machine to handle this type of work.



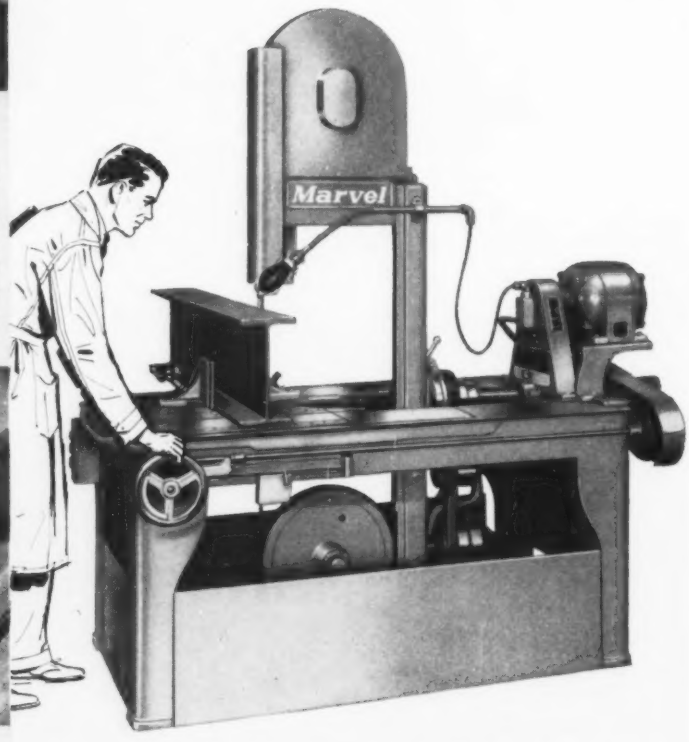
MITERING LARGE DIAMETER PIPE

Pipe (or any bar shape) may be mitered at a 45° angle without the need for special jigs or fixtures. Even when cutting miters, work remains in the same position as it does for straight cuts. Column and blade are instantly tilted to desired angle, even without stopping the machine. Perfect miters (or lesser angles) are sawed without any layout or special equipment.

SEGMENTING LARGE DIE BLOCK

Three equally spaced re-entrant cuts were made in this 16" x 18" SAE 4130 Forging. Job was completed, floor-to-floor in 5 hours. No special jigs or fixtures were required. An unusual job that serves to emphasize the versatility of the MARVEL No. 8 Saw.

"The One Machine We Couldn't Do Without"



"As simple to use and handy as a Scout Knife" is the way another user described his MARVEL No. 8 Universal Band Saw recently . . . and we can't think of a better way to describe this versatile metal cutting machine.

With a MARVEL No. 8 Band Saw, you can do almost any conceivable straight, angle, or miter metal sawing job—from cutting-off bar stock to making the most unusual forming cuts. You can handle small, delicate work, and in the next minute, saw structurals, or segment large work as illustrated in the lower photograph. You will save time, labor, and material with a MARVEL No. 8 Band Saw because no other saw has all the features to be had in this truly universal tool.

Upright column design and forward travel of the blade through the work (which remains stationary on the table-height saw bed) provides easy, unobstructed visibility and more convenient and efficient working conditions; column can be tilted and locked at any angle up to 45° left and right of vertical; the exclusive MARVEL Power Feed with Automatic Overload Relief; Automatic cutting-depth stops; simple, convenient operating controls—these are some of the features which make the No. 8 Band Saw the most useful—and used—metal cutting saw on the market.

For the complete story, ask or write for Bulletin 875 which illustrates and describes MARVEL Universal Metal Cutting Band Saws.

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Builders Agree to Standardize

It's a Major Break for Building Block Concept

Machine tool companies have reversed their individual design stand to standardize some components.

It will mean more flexibility, longer life for automated setups. —By E. J. Egan, Jr.

▪ The much-discussed building-block concept for getting more flexibility and longer life out of automated machining setups is now reality.

For the First Time—In a history-making break with individual design traditions, major U. S. machine tool builders agreed last week to standardize dimensions on some components for transfer lines and other mass-production machining layouts.

This opens the door to even bigger savings with automated machining. No longer will a setup for the volume production of a particular part have to be virtually junked while it's still in prime condition, simply because the basic part design is altered slightly.

How It Works—Now, if a design change calls for, let's say drilling more holes in a part, the producer will just buy as many of the new-standard drill feed units as he needs, and from whatever source he prefers. To mount them properly, he'll then buy whatever he needs in the way of horizontal bases, wing bases, vertical columns, or angular columns —all made to the new standard dimensions, of course.

The next step is to pop these newly-created machining stations into the previous setup; standardized heights and bolt-hole locations will link them up perfectly with the stations he was using before.

The Reporter — News of the agreement on building block standards came from Henry C. Daum, manager of Ford Motor Co.'s process machining department, and chairman of an industry study committee of major machine tool builders and users.

The accord reached last week caps four years of work on the unitized design concept first proposed jointly by Ford, General Motors, Chrysler, and International Harvester in 1955.

Changes Include — Mr. Daum emphasized that the present agreement includes only a limited number of standard specifications. It is not intended to dictate design features to individual machine tool builders, he said.

Encourage Advancement— "Building-block or unitized automation should encourage technological advancements and design changes that benefit the buying public," he added.

Mr. Daum also believes the new standards will put automatic machining lines within the financial reach of many smaller companies.

FORD'S H. C. DAUM: Chairman of the joint industry committee which brought tool builders and users into accord on building block standards.

INDUSTRIAL BRIEFS

More Power to You—The Pennsylvania Transformer Div., McGraw-Edison Co., opened a new department for the manufacture and sale of secondary unit substations and low voltage switchgear. Production facilities and office are located at Canonsburg, Pa.

Press Plant for Sale—E. W. Bliss will sell its manufacturing facilities in Toledo. Formerly a metalworking press manufacturing plant, the facilities include a 165,000 sq ft Meehanite foundry capable of handling castings up to 60 tons and a 230,000 sq ft heavy machine shop. The plants have been inactive for over a year.

ASM Honors Holden — The American Society for Metals, Detroit Chapter, presented the Society's 25-year certificate award to A. F. Holden, president, A. F. Holden Co., Detroit. His most recent development is a gas-fired, luminous wall furnace using infrared radiation in the heat treatment of super alloy structures in jet aircraft, space rockets, and anti-aircraft missiles.

"What's this I hear about a merger between you guys and amalgamated?"

Furnace Speeds Rocket Work—A heat treatment facility to manufacture cases for solid-propellant rocket motors, is being built at Evendale, O. Scheduled to be in operation by March, 1960, at General Electric's Flight Propulsion Lab Dept., the new furnace will be able to process rocket cases up to 30 ft long and 10 ft in diameter.

Northwest Can Source—National Can Co. is building a plant at Vancouver, Wash., to handle about 150 million cans per year. Joint efforts of the Port of Vancouver with the Washington Canners Inc. of Vancouver and other Oregon-Washington can users brought National Can into the Pacific northwest.

Tank, Trailer Acquisition—Standard Steel Corp., Los Angeles, acquired the Cambridge Co., Lowell, Mass., from Carrier Corp. Over $4 million in assets were acquired by Standard plus orders for the manufacture of liquid oxygen storage tanks and trailers. Cambridge will be an operating division of Standard.

Expanding and Consolidating—Reynolds Metals Co. is expanding its aluminum strip conductor coil winding facilities at Richmond, Va. Also to be consolidated at its Richmond North plant are facilities for foil gauge and sheet gauge strip conductor. Previously the two types of facilities were at separate Richmond locations.

Mexican Order—A contract for a complete new steel rolling mill has been awarded to Birdsboro Steel Foundry & Machine Co., by Altos Hornos de Mexico, S. A., Monclova, Mexico. The mill is equipped to roll billets for subsequent conversion into rods, merchant bars, reinforcing bars, and light structural shapes.

Keeping Up With Packaging—Arthur Colton Co. is expanding facilities for producing packaging machinery. The Mancelona, Mich., plant, will manufacture Colton packaging machinery exclusively. The company is building a new plant in Elk Rapids, Mich., to manufacture punches and dies formerly made at the Mancelona plant.

Valves a la France—Walworth Co. has organized a new French corporation, Grove-France, S. A., to manufacture and sell valves for pipelines in France and its possessions. The new company has an authorized capital of 60 million francs. Arrangement has been made for manufacturing facilities at Soissons.

Galvanizing Balance—Dominion Foundries & Steel Ltd., Hamilton, Ont., has plans underway for installing a second continuous galvanizing line to coat sheet steel with zinc, aluminum, and other types of coating. The new galvanizing line will bring Dofasco's finishing capacity in line with its ingots production capacity of 1 million tons a year.

Cleaner Air at Dow—The Dow Chemical Co., Midland, Mich., dedicated its new industrial incineration plant. The plant was built at a cost of $2.2 million to reduce air pollution.. Dow's waste treatment plants now have a capacity to handle the equivalent sewage from a city of 300,000 persons and the refuse of a city of 70,000.

Anaconda Aluminum Grows—Pittsburgh Engineering & Machine Div., Pittsburgh Steel Foundry Co. will manufacture a 66-in. four-high Aluminum Breakdown Mill for Anaconda Aluminum Co. Order is part of a $2½ million expansion program to increase production of aluminum strip at the Terre Haute, Ind., plant.

Distributor Named — The Ellwood Ivins Steel Tube Works, Inc., has appointed as exclusive distributor for their seamless and welded tubing, the E. D. Giberson Co., Masbeth, Long Island. They will represent Ellwood Ivins in North Jersey, metropolitan New York, Long Island, and New England.

basic refractories

BRICK AND SPECIALTIES

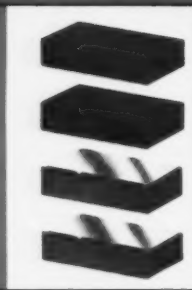
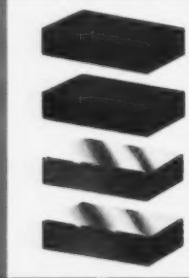
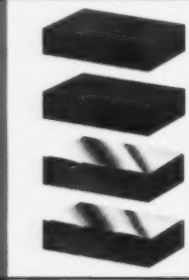
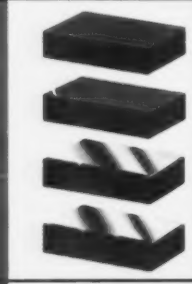
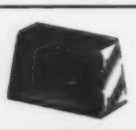
REFRACTORIES DIVISION PORTER H. K. PORTER COMPANY, INC.

Porter basic refractories

Porter basic refractories are produced at Pascagoula, Mississippi by the most modern methods and equipment available.

The operation includes both a chemical processing plant for making periclase and a brick and specialty manufacturing plant.

This bulletin gives a brief description of Porter's basic refractory products. Detailed information on specific products and applications will be supplied on request.

CLASSIFICATION		BRANDS	BOND	APPLICATION AND SPECIAL DATA
70% Chrome Ore 30% Periclase		CM—30	Chemical	Open hearth and electric furnace bottoms, banks, and walls—Copper reverberatories and converters—Glass tank regenerator walls and arches—Soaking pit slag lines and heating furnace hearths—Sulphate recovery furnaces.
		CM—30B	Ceramic	
		*CM—30 Clad	Chemical	
		*CM—30B Clad	Ceramic	
60% Chrome Ore 40% Periclase		CM—40	Chemical	Open hearth furnace walls and roofs—Non-ferrous metal furnaces—Burner blocks, very coarse grain—High resistance to spalling.
		CM—40B	Ceramic	
		*CM—40 Clad	Chemical	
		*CM—40B Clad	Ceramic	
70% Periclase 30% Chrome Ore		MC—70	Chemical	Exposed walls of open hearth and electric furnaces—Glass tank regenerator walls, arches, caps, and ports.
		MC—70B	Ceramic	
		*MC—70 Clad	Chemical	
		*MC—70B Clad	Ceramic	
100% Periclase		M—90	Chemical	Open hearth and electric furnace bottoms, banks, and slag line areas—Glass tank checkers—Copper converters and reverberatories.
		M—90B	Ceramic	
		*M—90 Clad	Chemical	
		*M—90B Clad	Ceramic	
Periclase and Chrome Ore		*KILMAG	Ceramic	Hot zones of rotary kilns such as dolomite—cement—periclase, etc. Maintains coating in Portland Cement kilns.

*Clad—Steel Cased.

Shipping Point: Pascagoula, Mississippi, and selected warehouse locations in the U.S.A.

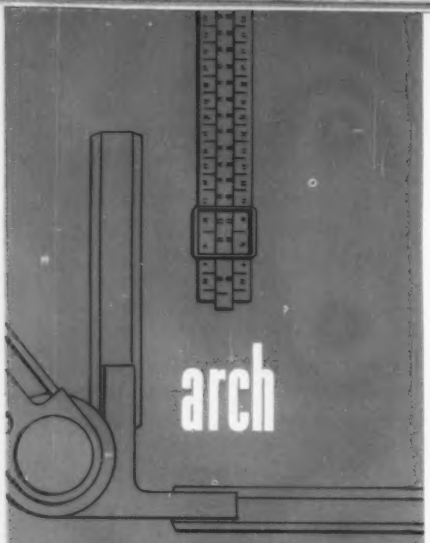
Porter basic specialty products

Are made by the most exacting standards to give maximum performance for each specific application.

Below is a list of basic specialty products currently available. In addition, specially ground chrome ores and Periclase are made on request.

CLASSIFICATION		BRANDS	CONTAINER	APPLICATION AND DESCRIPTION
Mortars		KROMTITE	100 lb. bags	Air setting chrome mortar for laying up all types of clay, high alumina and basic brick. Shipped dry.
		KROMTITE-H	100 lb. bags	For use when only a mild air set is desired. Shipped dry.
		PERATITE	100 lb. bags	Heat setting periclase mortar for laying up periclase brick. Shipped dry.
Plastics		PLASTIKROM	200 lb. drums	An excellent ready to use plastic chrome ore for open hearth door linings, heating and forging furnace bottoms, and for general repairs in steel mill furnaces—Excellent for sulphate and sulphite recovery units.
Castables		KROMFORM	100 lb. bags	Dry air setting chrome ore castable for boilers, heating furnaces, and other industrial furnace applications.
		SUB-HEARTH KROMFORM	100 lb. bags	A dry chrome ore mix suitable for trowelling, ramming, or casting sub-hearths in industrial furnaces.
Gunning Mixes		AIRKROM F	75 lb. bags	Fine ground chrome ore suitable for use with tank type guns in all furnace maintenance programs.
		AIRKROM C	75 lb. bags	A chrome-periclase mix for use with guns which mix at nozzle—All gunning applications.
		AIRMAG	75 lb. bags	A specially prepared periclase mix for use when gunning tap holes—bottoms, etc.
Refractory Products		KROMOR	100 lb. bags	A dry, chrome ore for leveling and laying up all brick work. Excellent when used as a furnace maintenance material.
Ramming Mixes		MAGNARAM 85	100 lb. bags	Dry periclase mixes for ramming new bottoms of open hearth and electric furnaces plus repairing holes in bottoms and banks. Magnaram 95 is the highest in MgO content.
		MAGNARAM 95	100 lb. bags	
Special Products	SPECIAL GRINDS AS REQUESTED. SHIPPED, BULK or BAGGED.			

Shipping Point: Pascagoula, Mississippi, and from warehouses and distributors throughout the U.S.A.



arch and wall department

Porter's refractory engineering includes the Laclede Arch Department, which has been designing and supplying suspended arches and supported wall construction since 1904.

Porter's refractory engineers are specialists in engineered furnace refractory enclosures that serve major industries—steel, nonferrous, glass, cement, power, chemical, etc.

In selecting refractories and heat enclosures for industrial furnaces, Porter policy is "greatest furnace availability at lowest cost."

Porter's Refractories Division does not design or build furnaces, but it does cooperate with designers, builders and users in supplying data on properties of refractories and other useful information.

Mechanical, combustion, and ceramic engineers on Porter's staff have a wide experience in the use of all types of refractory materials, and their services are available to the users of refractories.

Call or write.

sales offices

GENERAL OFFICE
Porter Building
Pittsburgh 19, Pa.

DISTRICT SALES OFFICES

New York:
300 Park Avenue
Telephone: Murray Hill 8-8550

Philadelphia:
Unruh & Milnor Streets
Telephone: Devonshire 2-5000

Birmingham:
2800 Alabama Street
Bessemer, Alabama
Telephone: Hamilton 8-6221

Chicago:
5 South Wabash Avenue
Telephone: Andover 3-6255

St. Louis:
2064 Hampton Avenue
Telephone: Mission 7-2400

San Francisco:
1485 Bayshore Blvd.
Telephone: Juniper 6-1452

Pittsburgh:
Porter Building
Telephone: Express 1-1800

Houston:
2712 Danville Rd., Office No. 107
Houston 6, Texas
Telephone: Jackson 6-4713

Los Angeles:
2947 East 44th St., Vernon 58, California
Telephone: Ludlow 7-7207

REFRACTORIES DIVISION PORTER **H. K. PORTER COMPANY, INC.**

Bulletin No. 71

Litho in U

J. E. Kunkler, elected vice president, Armco Drainage & Metal Products, Inc., Middletown, O.

The Budd Co.—**Dr. J. H. Buck,** appointed vice president and general manager, Tatnall Measuring Systems Co., and Nuclear Systems, a Budd subsidiary and division respectively.

Nichols Wire & Aluminum Co. —**L. W. Disney,** elected vice president and treasurer.

The Higgins Metal Products Co. —**E. A. Rutchow,** elected vice president, sales.

J. H. Williams & Co.—**E. R. Burkardt,** elected vice president, tool sales.

Blaw-Knox Co.—**G. M. Read,** named consultant to the president, research, engineering, and development, Pittsburgh.

The Babcock & Wilcox Co., Refractories Div.—**R. A. Barr,** appointed general manager.

The Carpenter Steel Co.—**N. D. Groves,** named asst. manager, research, chemistry and physics; **N. J. Culp,** named asst. manager, research, Metallurgical Dept.

Copperweld Steel Co. — **J. R. Waters,** named Philadelphia district sales manager.

The Whitney Chain Co., subsidiary of Foote Bros. Gear & Machine Corp.—**W. O. R. Korder,** appointed general marketing manager, Foote and Whitney operations.

The Budd Co.—**J. C. Collins,** appointed manager, market research.

Armco Steel Corp.—**W. A. Frederick,** appointed superintendent, North Processing Dept., Butler Works.

De Laval Steam Turbine Co.— **P. S. Nurko,** appointed works manager, Trenton, N. J.

The Colorado Fuel & Iron Corp. —**H. F. Alvord,** appointed asst. to the manager, industrial relations, Buffalo, N. Y.; **J. H. Stenmark,** named superintendent, industrial relations, Pueblo, Colorado, plant.

J. S. Kline, appointed general manager and chief executive, Alloy Tube Div., Union, N. J., The Carpenter Steel Co.

U. S. Steel Corp.—**F. J. Herman,** appointed superintendent, openhearths, Youngstown District Works.

SKF Industries, Inc. — **K. W. Seton,** appointed manager, Sales Contract Dept., Philadelphia; **W. L. Rhodes,** appointed regional marketing analyst, midwestern sales region.

General Electric Co.—**H. J. Bigalow** and **R. S. Papoojian,** named technical service engineers, phenolic

(Continued on P. 58)

J. W. Eason, appointed manager, Baltimore Div., Revere Copper & Brass Inc.

H. B. Young, elected staff vice president, engineering and research, ACF Industries, Inc.

W. E. Lunger, elected staff vice president, manufacturing, ACF Industries, Inc.

BRAZE WELDING adds strength, helps prevent squeaks, leaks, and rattles in Rambler's all-welded, single-unit construction of body and frame.

Extension side roof and roof panel on a Rambler Cross Country station wagon being joined by oxyacetylene braze welding with Anaconda-997 (Low Fuming) Bronze Rod. Braze weld between rear quarter pillar and side roof rail (to left) is one of several made primarily to prevent water leakage. American Motors welding engineers have found braze welding with Anaconda-997 (Low Fuming) Bronze Rod to be an efficient and economical production tool. The alloy bonds to steel easily. The relatively low application temperature minimizes distortion and makes it easy to control weld metal. Welding operations on a moving assembly line are fast, and finishing time is reduced. The rod's low fuming characteristics make normal ventilation facilities adequate.

There are up to 30 areas, depending on the model, where braze welding is used to augment electric welding to give American Motors Ramblers an all-welded, single-unit construction of body and frame with high strength, safety, and quiet operation. American Motors claims for this construction elimination of squeaks and rattles, also better utilization of space and greater durability.

OXYACETYLENE braze welding is being used increasingly for economical assembly of many steel articles which do not lend themselves to joining by arc welding or resistance spot welding. Applications range from auto bodies and appliance cabinets to frames for bicycles. In most cases, Anaconda distributors can help you select the rod for your job. But if you have a special problem, Anaconda welding engineers are at your service. Write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

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WELDING ROD AND WIRE

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INGERSOLL STEEL B-W BORG-WARNER

Ingersoll STEEL DIVISION

1884 75 YEARS 1959

Borg-Warner Corporation • NEW CASTLE, INDIANA

(Continued from P. 55)

and polycarbonate plastic materials, Chemical Materials Dept., Pittsfield, Mass.

Granite City Steel Co.—**J. E. Goodin,** promoted to acting superintendent, Open Hearth Dept.

The National Acme Co.—**R. B. Smith,** appointed regional sales manager, Western district territory including Canada.

The Yale & Towne Mfg. Co., Yale Materials Handling Div.—**William Wire,** appointed asst. sales manager, Worksaver and Warehouser Sales; **C. J. Riewe,** appointed field sales engineer, Worksaver and Warehouser Sales Dept.

Joseph Dixon Crucible Co., Crucible and Refractories Div.—**Raymond Rathyen,** appointed product manager.

Cooper Alloy Corp. — **E. A. Margus,** appointed asst. director, product engineering.

R. K. McConkey, promoted to general manager, Industrial Div., The Timken Roller Bearing Co.

J. D. Kirkwood, named general manager, sales, Truscon Div., Republic Steel Corp., Youngstown, O.

Federal Products Corp., Contract Services Div.—**I. A. Hunt,** appointed manager.

The Warner & Swasey Co.—**R. L. Groves,** appointed administrative assistant, Sales Dept.

OBITUARIES

A. I. Davey, retired vice president, Empire Steel Corp.

C. B. Smith, 63, director service, Allis-Chalmers Industries Group, Allis-Chalmers Mfg. Co.

V. C. Hart, 58, field sales engineer, The Bullard Co., Bridgeport, Conn.

Here's the detachable container system of a hundred uses. The simple, powerful, one-man DEMPSTER-DINOSAUR automatically picks-up . . . hauls . . . dumps . . . puts down . . . or pushes off on dock, loads limited only by the size of the truck or by highway restrictions. All handling operations are performed without the driver leaving the cab . . . no cables to hook on . . . no chains . . . . . . sheaves . . . winches. Models available for single or tandem axle chassis . . . 22,000 to 30,000 pound gross loads. Containers, six to 40 cu. yds. and over, available for refuse, scrap, materials handling, cargo, "boxy-back" rail shipments and many other uses. Write today for brochure or for a demonstration in your city.

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MidVac Rolls are made with consumable electrode vacuum melted MidVac Steels. These super-alloy steels produce a Micro-Lustre finish made possible by super uniformity of fine grain structure, maximum freedom of defects and non-metallic inclusions. MidVac Micro-Lustre Rolls assure rolling free from surface imperfections . . . quicker regrinding . . . and give longer trouble-free service between grinds.

MidVac Rolls are being used throughout the nation for rolling stainless steel, aluminum, foil, brass and precious metals. Midvale-Heppenstall also make forged rolls of any size, for any purpose required in the rolling of steel, aluminum, copper, brass and other metals . . . as well as paper, plastics and rubber. Write for complete data on these new Micro-Lustre Rolls.

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It's easy for the operator to raise or lower loads while pulling a trolley mounted Coffing Quik-Lift Electric Hoist. The design of the pistol-grip control station and the combination strain and power cable makes this possible. The light but strong aluminum housing provides ease of portability. Changing voltages, limit switch, type of suspension or chain is quick because the housing is in sections.

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For Efficiency in load handling specify Coffing Quik-Lift. Twenty models—capacities range from ¼ to 2 tons. Ask your distributor for details or write for Bulletin ADH-65.

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- Easily Adjusted Limit Switch
- Complete Line of Accessories

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QUIK-LIFT AIR HOIST

CHAIN HOISTS

COFFING HOIST

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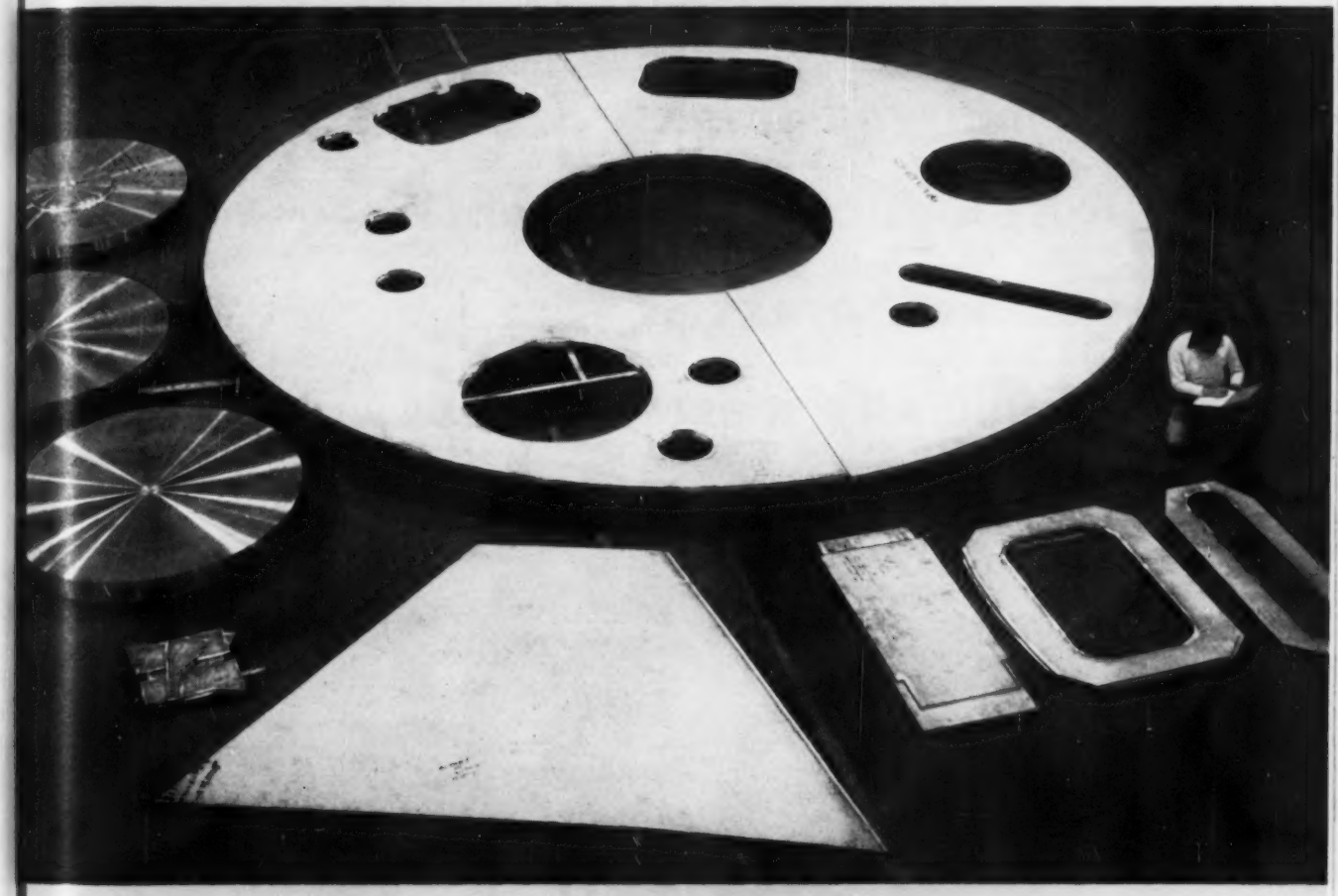

• **Stainless steel is our only business—and we know it!** Producing to your specified tolerances in shearing, sawing, abrasive cutting, flame cutting, forming and machining stainless steel plate is a regular Carlson service. This accuracy in manufacturing saves time and money in your shop. Fabrication is easier; true-up time is cut to a minimum.

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think of brass...
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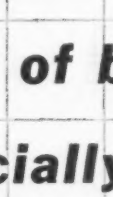

Western
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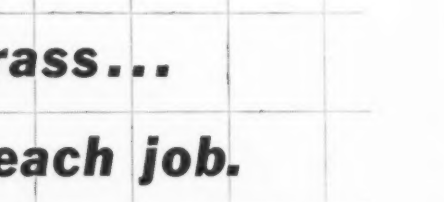

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Western BRASS

MILLS: East Alton, Ill., New Haven, Conn. • SALES OFFICES: Boston • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Decatur, Ga. • Detroit Grand Rapids • Indianapolis • Long Island City • Los Angeles • Milwaukee • New Haven • Philadelphia • Rochester • Rockford, Ill. • Saint Louis

How Hydraulic Systems Benefit From Simple Maintenance

Just taking care of early signs of trouble can produce big savings in hydraulic maintenance.

It's the basis of a plan that requires no investment, just cooperation and a very little effort.

• When it comes to maintenance of hydraulic systems, there's a wealth of educational material available just for the asking. In addition to manuals and published articles, there are training programs and various printed devices available to the user with his hydraulic problems.

In spite of these aids, there's a reluctance to get involved in an established maintenance routine. That the cost of this neglect is high is attested by G. C. Bonnell, Service Manager, Machinery Hydraulics Div., Vickers Inc., Detroit, in his talk at the company's recent conference on hydraulics for fabrication machinery.

Need Basic Knowledge—He finds that many times his service men travel many miles only to find that the cause of the hydraulic trouble could have been solved by the user with only a basic knowledge of hydraulics.

In some cases it's only insufficient oil in the reservoir or clogged and dirty oil filters. Sometimes it turns out to be a pump shaft turning in the wrong direction or use of improper grades of oil.

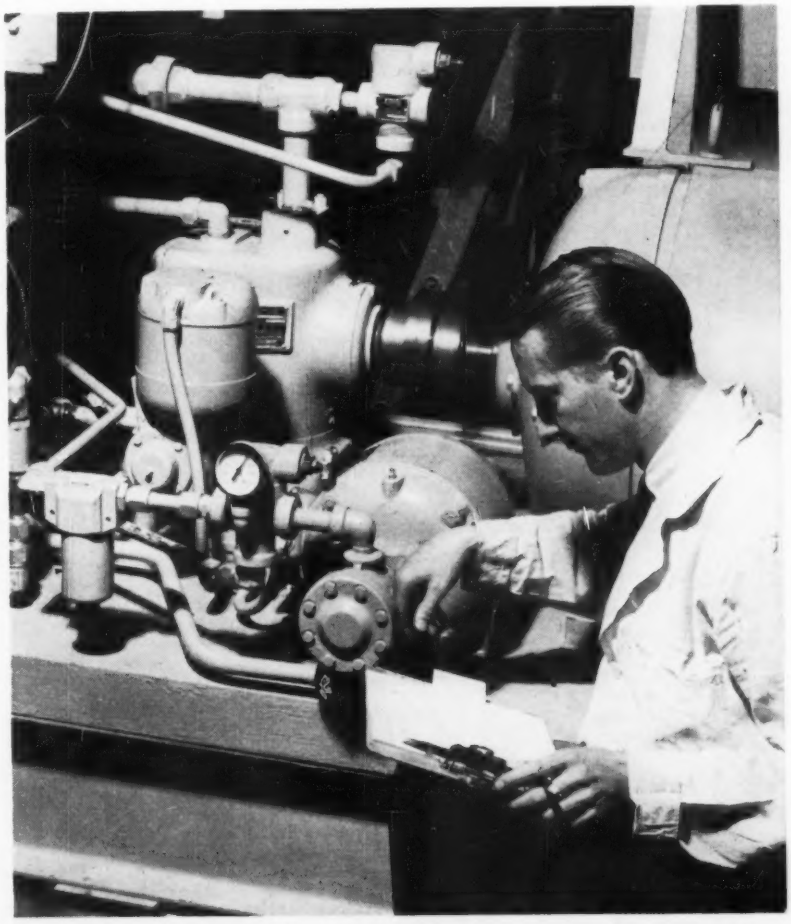
Intake lines can be loose. Operating pressures can be set too high or too low.

Some Ignore Obvious — Service reports often show that while one machine was being serviced, other machines in the area were crying for attention. But the customer's reaction to an offer to check on a condition often runs like this:

"We can't shut that machine down now, besides that pump has been running like that for quite a while now." More often than not, an emergency call a few weeks later turns out to be a major breakdown on the very pump that made a little noise and just leaked a little.

The odds against a major breakdown would be much improved if all maintenance personnel and machine operators too could be taught to recognize trouble signs. Plants that operate with the fix-it-when-it-breaks-down type of maintenance are contributing the most money towards paying industry's 11 billion dollar annual maintenance bill.

How to Sell Plan—Part of the blame for this situation lies with the



ROUTINE CHECKS PAY: A simple check can catch early warning signs of hydraulic trouble. Maintenance man determines if system is overheating.

proponents of preventive maintenance. They often make it sound like a grand plan with everyone in the plant running around with maintenance records in one hand and the service kit in the other.

It's easy to understand why such a program might be difficult to sell to management. With this in mind, here's a maintenance plan that requires no investment—just cooperation and a very little effort.

It's a simple down-to-earth plan aimed at the fix-it-when-it-breaks-down group. It may even provide added savings for plants that operate with a planned preventive maintenance program.

Know the Signs—First step is to train eyes, ears and sense of touch to recognize the signs and symptoms of possible hydraulic trouble. Your hydraulic repairmen must know these signs and be aware of the probable cause and course of corrective action.

Next is to provide written instructions for machine operators on how to recognize the signs and symptoms. But don't concern them with the cause and cure—only the symptoms.

As many people as possible should be recruited for the campaign. For example, the oilers should watch for and report loss of oil and oil deposits which may indicate leakage from cylinders.

Fast Action Pays—Immediate action on reports of potential trouble is essential. Report forms should be kept simple. Here's one that will do the job:

Prepared by the maintenance de-

Early Detection and First Aid Stop Breakdowns

TROUBLE	CAUSE	ACTION
Noisy Pump	1. Restricted intake	Clean intake strainer. Check intake piping for obstruction.
	2. Cavitation at pump inlet	Fluid viscosity too high or partially restricted
	3. Pump picking up air a. around shaft or head packing b. at loose or broken intake pipe	Replace packings, grease pump fitting. Repair or replace pipe.
	4. Worn pump	Disassemble pump, inspect internal parts for wear.
	5. Excessive pressure	Check relief valve setting and for line restriction (clogged or undersize lines).
	6. Excessive speed	Check prime mover speed and operate pump within recommended limits.
No Pressure Fluctuating Pressure	1. Broken pump shaft 2. Vanes stuck in rotor (vane pump) 3. Worn pump 4. Relief valve a. Large piston stuck open b. Small hole in large piston plugged c. Piston or valve seat in cover damaged d. Dirt between piston and seat in relief valve control head	Disassemble, inspect pump parts. Disassemble valve, clean, replace damaged parts.
Relief Valve Chatter	1. Piston or valve seat in cover damaged 2. Dirt between piston and seat in relief valve control head	Disassemble valve, clean, replace damaged parts.
Four-Way Valves not Shifting	1. Electrical trouble (Solenoid operated valves)	Shift solenoid by hand. If valve operates, call electrician to check circuit.
	2. Pilot pressure too low (Pilot pressure operated valves)	Should be 50 psi minimum.
	3. Main valve spool sticking	Disassemble valve, clean up spool and bore with crocus cloth if necessary to free spool.
Machine Feed Slowed Down	1. Slot in throttle valve dirty	Remove throttle, clean out valve slot.
	2. Weak or broken hydrostat spring	Replace spring.
Chatter in Feed	1. Sticky hydrostatic valve 2. Machine ways lack lubrication or are out-of-line	Disassemble and clean hydrostatic valve. Check and correct.

partment, it should start with a description of symptoms reported along with the date. Next should be a recording of what the preliminary investigation indicated. Here again each entry should be dated.

The report should show what corrective action was taken and how long the machine was down if repairs were made during normal production time.

Reports Have Purpose — Copies of reports should be filed and analyzed periodically. By keeping a record of major breakdowns, you will soon find the areas which need special attention.

There's no trick to recognizing the signs of hydraulic trouble. Leaking lines and oil deposits on a machine or floor are clearly visible.

Dirty, discolored oil or low oil level in the reservoir can be seen. You can normally tell by touching the equipment whether the system is overheating.

Easy to Spot—An operator can certainly hear any unusual noises such as shocks in the system, malfunctioning valves or noisy pumps. And such troubles as spongy action of the ram or low or high pressures can certainly be spotted by the naked eye.

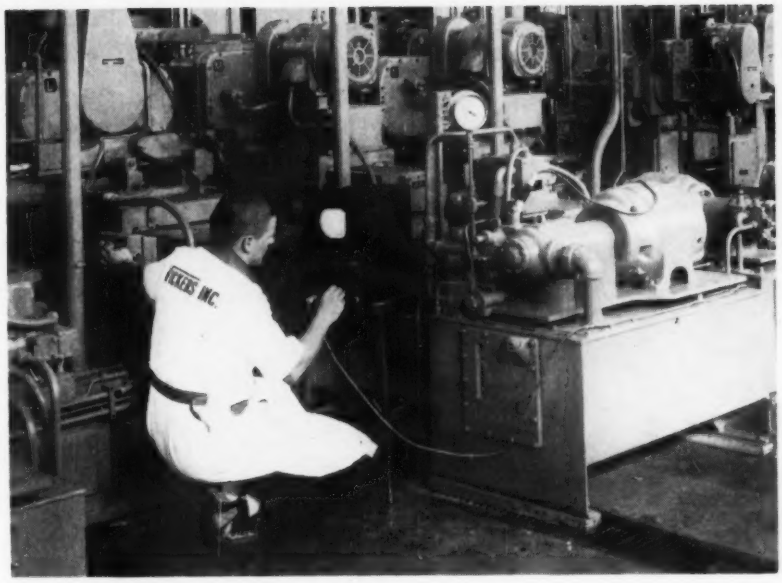
So, by just using ears, eyes and sense of touch, many hydraulic difficulties can be eliminated before a major breakdown occurs. The accompanying table lists some trouble-shooting hints.

One way to reduce downtime in event of breakdown is to give a good description of symptoms when making the call for an outside serviceman. He's then in a better position to take fast corrective action with spare parts at hand.

Check Early — While there's no substitute for preventive maintenance, the plan just described will provide a lot of help toward reducing maintenance costs and problems. Just taking care of early signs of trouble can bring profitable results.

Vickers interest in maintenance stems from the fact the company wants its hydraulic components to give the user years of trouble-free service. To keep such parts at peak efficiency requires a little help from the user.

To aid customers, Vickers runs a training program on basic hydraulic design and maintenance. Students come from all parts of the world.



PRESSURE COUNTS TOO: Serviceman locates pressure surges with hydroloscope. Excessive surges cause pump damage, overheating and leakage.

LOOK AT THE RECORD: One of these molding machines has run at full production for 17 years at a hydraulic maintenance cost of less than $50. Its pump has never been removed. Fluid is analyzed every six months.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

POSTFORMED PARTS: These parts were all made by postforming. The front pieces were drawn and formed with and against the grain while the rear part is a formed angle. It's suited for short production runs.

Shape Laminated Parts By Low-Cost Postforming

By **H. L. Hildebrand**—Manager, Fabricating Div., Taylor Fibre Co., Norristown, Pa.

Certain laminate grades can be postformed. No machining is necessary.

There's nothing to lose. Setup costs are low and the procedure is easy to follow.

▪ Laminates are made from thermosetting plastics that usually harden when heat is applied. But it's wrong to believe that once laminated plastics are formed into sheets, rods or tubes, further shapes can only be made by machining, punching, drilling and sawing.

Certain laminates, when heated to just below the blistering point, can be postformed. And they won't unmold or deform seriously from the heat, as thermoplastic parts do.

Its First Success — Postforming began in aircraft industry where formed sheets were common, parts had to be both light and strong, and demands were for small quantities. Since then its use has moved into other fields where the needs are similar.

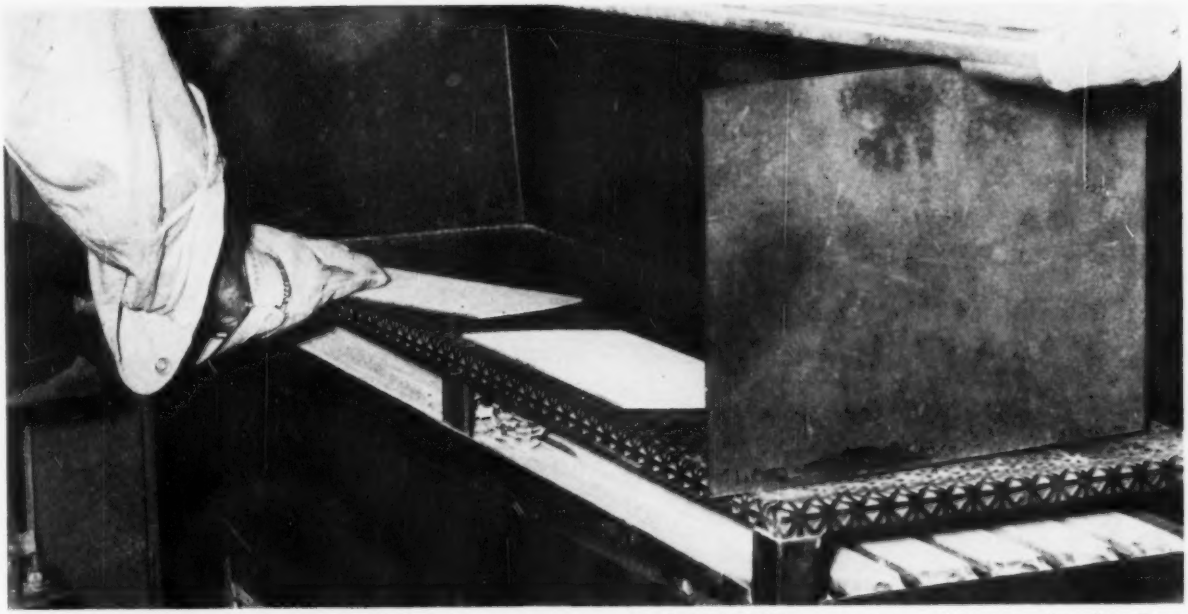
The postforming process itself is easy to understand. And once its few basic procedures are learned, the use of postforming should become even more widespread. It can be adapted to good advantage wherever short production runs are used or lower costs are needed.

Low Investment—There's no expensive outlay for special equipment. For example, molds can be made from metal, laminated or cast

Blister Times for Laminates*

Sheet Thickness, in.	Heating Time, seconds
1/32	20 to 35
3/64	30 to 50
1/16	40 to 70
3/32	60 to 95
1/8	80 to 120
5/32	100 to 160
3/16	130 to 200
7/32	160 to 240
1/4	180 to 260

* These times are typical in a hot-air forced convection oven at 450 to 500°F.



HEATING THE SHEETS: Electrical resistance element supplies the source to bring these sheets up to the 450°-500°F temperature prior to postforming. Part should be removed just before blister time.

plastics, hardwood, high-strength concrete or fortified plaster of Paris.

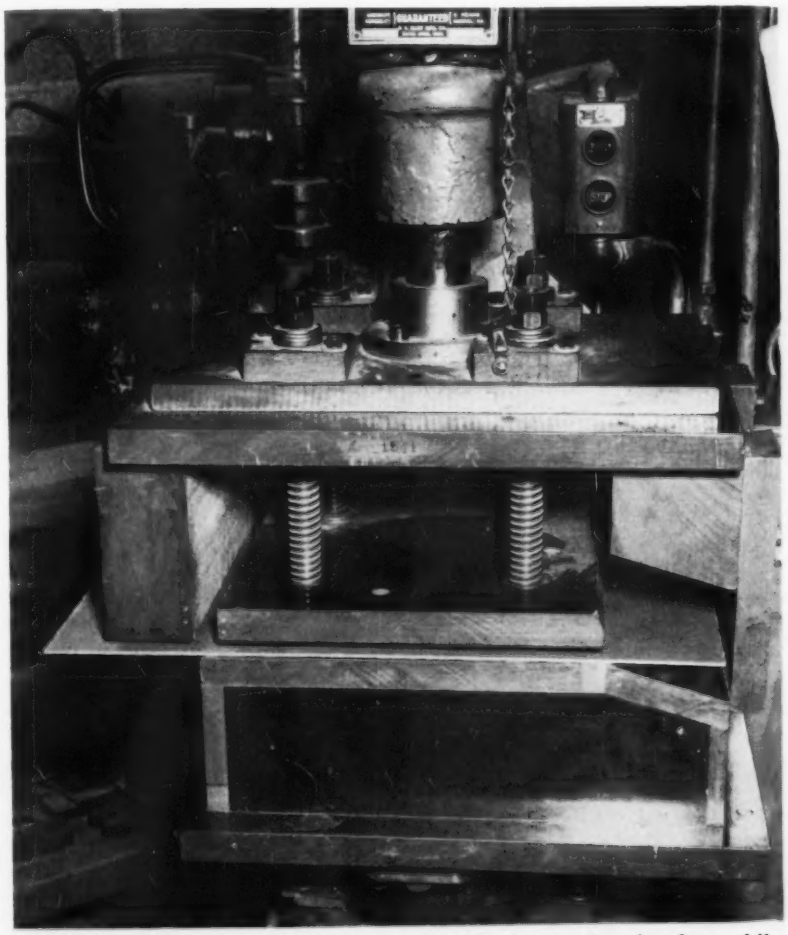
Heat sources can be hot plates and other equipment using electrical resistance elements, infra-red lamps, liquids of high boiling point, low melting alloys or mechanical convection ovens.

Since the molds exert pressures from 50 to 100 psi, there's a wide choice in forming equipment. Arbor, hydraulic or pneumatic presses and even hand-operated clamps can perform this end of the job.

Good Strengths — Aside from overcoming the cost factor in tooling up, postforming gives sound strengths. Since there is no reduction of the laminate's cross section at any point, the finished piece is not weakened. By contrast, when metal is drawn, the piece often weakens at point of most stretch.

Certain special laminates made for postforming can produce intricate shapes, compound curves and deep draws. Most of them are standard grades, like the cotton fabric-base types.

What to Use—But for the best results two materials are recommended. Both are phenol laminates

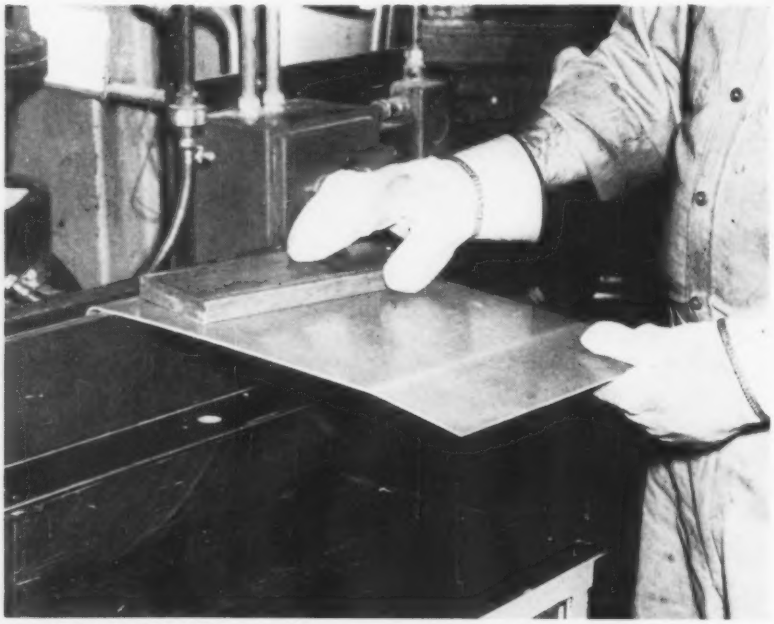


PRESS ACTION: Spring-loaded pressure plate keeps piece in place while 90° (left) and 15° (right) bends are applied to hot laminated sheet.

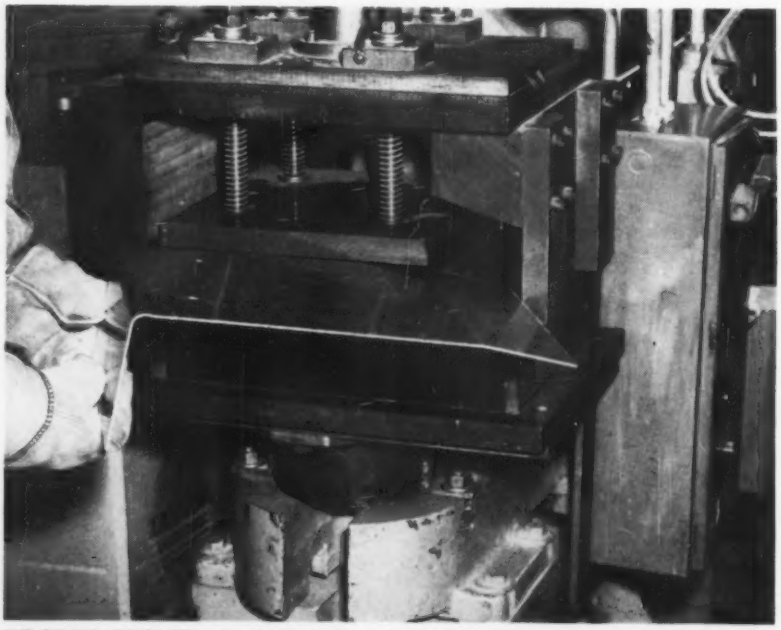
—one a fabric-base and the other a paper-base. The properties of both of these laminated plastics are very similar to the standard NEMA Grades C and XX.

The fabric-base grade is best when toughness, resilience, mechanical strength, abrasion resistance and formability are needed. On the other hand, the paper-base type is the one to use whenever good electrical properties or low costs are key factors.

Better Cooling Effects—Although forming or drawing molds can be made from many types of materials, metal provides the best source. Since metal draws the heat more rapidly from the piece being formed, it tends to speed up the cooling effect.



COOLING FIXTURE: Weight prevents the laminate from unmolding. Cooling fixture speeds up production, freeing press for further work.



PROPER SET: The laminated sheet has been in the press long enough for set to take place. Since it's cooled enough, it can be removed.

Hinged or folded dies should be used to form simple bends, like those found in channels. When building the mold, provide some means to prevent the workpiece from buckling or wrinkling. Pressure plates with stiff springs can keep the material in place.

Improving the Design—In most cases, though, the addition of several bead-forming inserts to the die can eliminate these hold-down plates. But remember that these beads must be set in the right places with respect to the direction of the wrinkles. So located, they will help in forming compound curves.

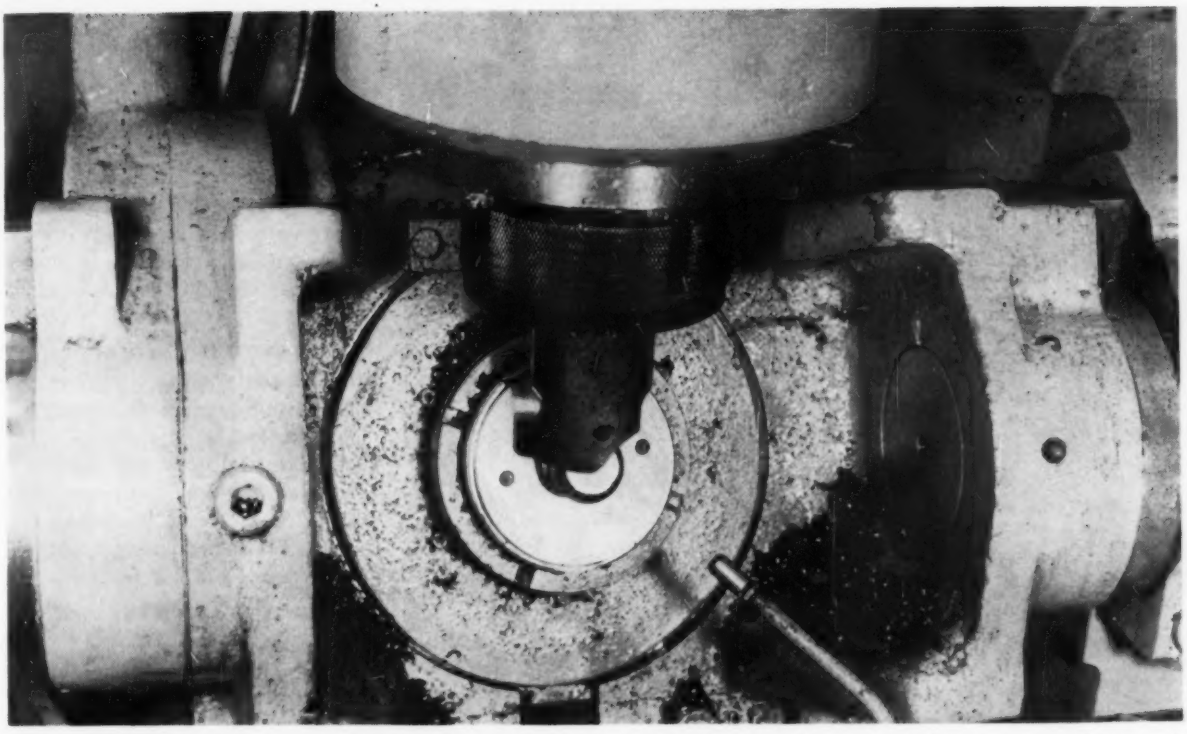
A good fit between the upper and lower half of the mold ensures the proper contour and produces an ironing action. Try to exceed a clearance of 0.010-in. more than the thickness of the material being formed.

The Blister Point—In starting the postforming procedure, heat the laminated plastic sheet until it is pliable. This occurs between 450° and 500°F. It's important to note how long it takes to heat the piece to its blistering point.

The correct heating cycle is just about 90 pct of, but at least five seconds less than, the blister time. Typical heating times in a 450° to 500°F hot-air forced convection oven are shown in the table.

Little Pressure Needed — As stated earlier, most forming operations can be done at 50 to 100 psi pressures. But, in transferring the work-piece from the heating source to the mold, move it quickly while it's still in a plastic state.

Then apply pressure on the piece until it has cooled enough for set to take place. Forced cooling of the mold will cut down this time. Water-cooled molds eliminate need of outside cooling fixtures, allowing parts to cool rapidly in the press.



FAST CUT: Two-bladed tool machines ball end of forged stud, removing 0.060-in. stock in 11 sec. Part rotates slowly, while tool spindle turns at cutting speed. Forced mist spray gives efficient cooling.

New Honing System Solves Ball Stud Processing

Two new special machines lick the old problem of producing precision ball-type parts. One unit turns the ball; the other finishes it.

The technique simply applies better geometry in tooling, and really pays off.

By R. H. Eshelman
Engineering Editor

▪ Machining ball-type parts has long been a problem in metalworking plants, with no satisfactory answer in sight. But now a new technique and two special machines promise to avoid this bottleneck.

The solution was developed by Micromatic Hone Corp. in an intensive research program, with the cooperation of production engineers of the Chevrolet Bay City parts plant.

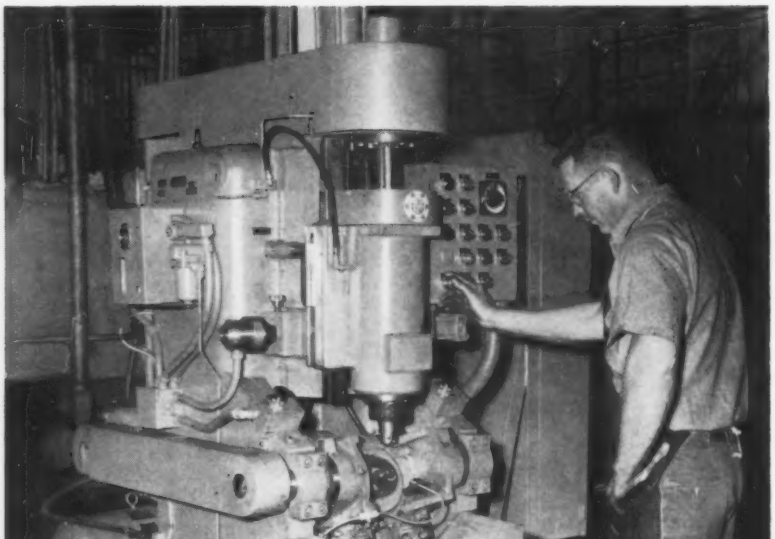
In the past, conventional methods for making ball stud-type parts have been expensive and not entirely satisfactory. More consistent quality and parts of closer tolerance were needed.

In the new setup, the ball stud is held with the shank tilted from vertical so that the center of the ball at the crown and the shoulder edge are in a horizontal plane, Fig. 1.

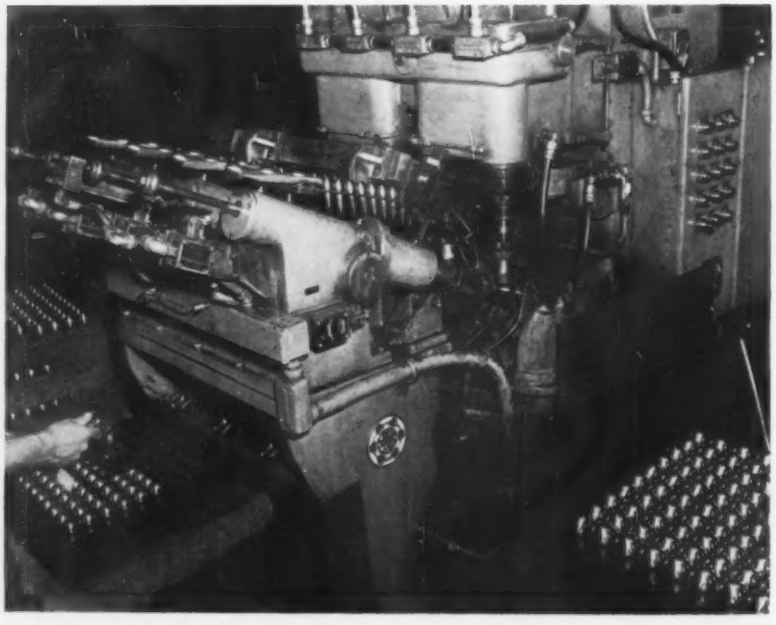
Turns at Angle — One of the problems in machining such parts conventionally, with the work turned around its shank axis, was holding the distance from the ball's centerline to a check point on the taper shank. Inaccuracies resulted from variations of cutting speeds from center diameter to top of ball.

This tool gives constant cutting speeds on the ball so that every point is machined at the same speed. In operation, the ball stud revolves slowly as the tool cuts.

The forged part is located on the shank taper and clamped on its thread. A special two-bladed tool has a cylindrical body with U-shaped cutouts on the end. Dual



SPECIAL MACHINE: Single-spindle unit developed to give best tool geometry for ball-part turning. Trunion fixture holds workpiece at proper angle for constant cutting speed over spherical surface. Productive capacity is over 240 parts per hour gross.



FINISH HONE: Four-spindle Micro-hone machine imparts 6-10 microinch (rms) surface to ball-parts. Feed is automatic from bar-rack. Operator checks finished part when ejected.

cutting edges are positioned at opposite ends of ball diameter.

Fast Cut—With these opposed cutting edges it's easier to control ball dimensions closely and to cut quickly. In fact, actual cutting time on a typical stud is only 11 seconds. The floor - to - floor cycle is 15 seconds with automatic clamping and ejection, and includes manual loading.

The tool uses two round dispensable carbide bits, both clamped. The clamp itself also serves as a chip breaker, preventing chips from curling back and scratching the work surface. Only a segment of the blade edge is used in cutting. It may be rotated and reversed, giving a number of usable faces.

Some 2400 balls are machined with two blades. Since the insert blades are prepositioned in a counterbore in the tool, no adjustment is necessary. Size is controlled to within 0.001 in. by depth of feed, which is set by an adjustable stop.

Production Features—This operation and tooling arrangement was developed for a single-spindle unit. It is virtually automatic in operation, with a hydraulic feed and wedge control that compensates for cutter wear. In the plant these machines are now loaded by an operator. But they're designed so they can be automatically fed with hopper loading, if desired later.

After machining, the ball is honed. This generates the needed geometric accuracy, size and surface finish. For this operation the stud is located and held the same way as for turning. However, this machine is a four-spindle unit, tooled for automatic operation. Productive capacity grosses over 600 parts per hour in a 24-second floor-to-floor cycle.

Fine Finish—About 0.002 in. of stock is removed in finishing. Sphericity is brought to within 0.0003 in., and the surface is from 6 to 10 microinches, rms. Tool motion gives a cross-hatch lay pattern and makes the abrasive self-

dressing. A special abrasive cup wheel, enclosed in plastic, is used. The plastic casing is threaded on the OD.

This thread acts as a score mark so that, as the stone wears, pressure caused by the plastic contacting the neck below the ball breaks the plastic at the mark. This occurs without cracking or breaking the abrasive. The stone life per spindle covers about 400 pieces.

Simplifies Processing — With the new technique the plant now heat treats the stud before the ball is machined and finished. This simplifies the processing greatly. It also improves the quality of the part. Any decarbonized metal is removed in machining. The result is a clean, functional surface.

The taper shank is then machined and ground, and the threads are rolled. In the next step the 8640 steel stud is heat treated to 30-34 Rc, prior to ball processing. Previously the cold-headed blank was chamfered and pointed. Then the shank was turned and tapered. After the taper was ground, the shop rolled the shank thread, drilled and chamfered the cotter pin hole; turned the ball diameter, heat treated, shot peened, rerolled the thread; and ground the ball. Finally, buffing or honing was done.

Big Payoff—In addition to better dimensional control, improved finish and streamlined processing, the new technique pays off in other ways too. The cutting tools are low-cost throw-aways. Being carbide, however, they permit spherizing tough, heat-treated materials. Tooling costs on machining are estimated at $0.001 per piece; while on finishing, the abrasive cost is about $0.004 per piece.

Where ball parts don't need an ultra-fine finish a single machining setup could cut unit costs and capital investment. Surface finish for the turning is in the 60-80 microinch (rms) range. This operation removes up to 0.070-in. stock on diameter and gives 0.001-in. or better tolerance on sphericity.

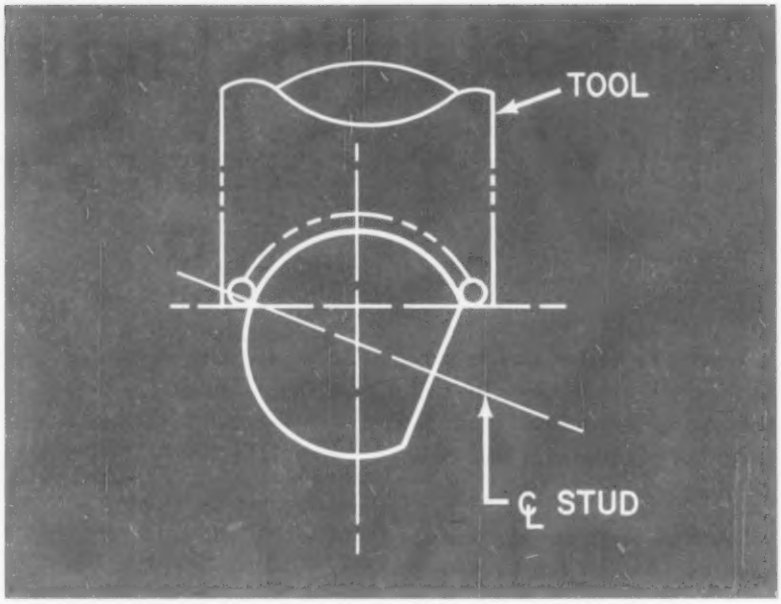


Fig. 1: Schematic shows angular position of ball-part in vertically tilted machine fixture and location of cutting blades.

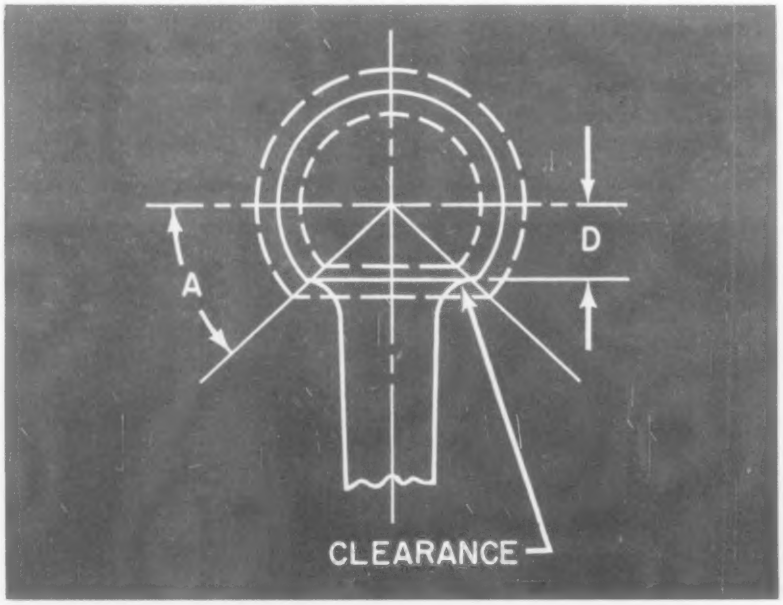


Fig. 2: To standardize ball-part design, hold angle A constant and maintain clearance at shoulder. Dimension D varies for three sizes shown.

Other Advantages—It's also possible to run several different sizes of balls on the same equipment. For this R. G. Ellis, Micromatic Hone development engineer, suggests standardizing design to save time, cut costs and simplify fixturing.

His recommendations (Fig. 2) include holding constant the angle formed by the centerline of the ball and the shoulder in all ball sizes and providing tool clearance below the shoulder.

Both units are adaptable to automated operations. They can also set up for flexible batch processing.

Cut Costs with Proper Care Of Coil Processing Equipment

By **John Krepp**—Senior Staff Engineer, Wean Equipment Corp., Cleveland

There's no better way to prevent costly downtime in coil processing equipment than to keep that equipment in mint condition.

Some of those savings you've been overlooking can be netted by following several basic rules.

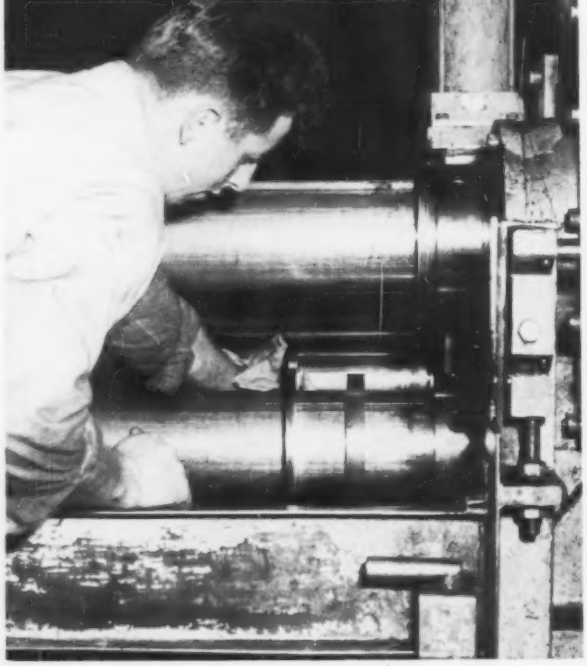
▪ Wherever metal fabricators have turned to coil processing on their own equipment, proper maintenance of such equipment can spell the difference between major savings and none at all. This is very true of slitter lines, for in a majority of plants they represent the most basic part of coil processing machinery.

Although maintenance is only one of the many problems in getting the most out of a slitting line, its importance can't be overlooked. Since quite a few trouble spots are common to all slitting setups, it's only logical to observe several rules of thumb to prevent unnecessary maintenance. The result could be a saving of thousands of dollars.

Coil processing equipment is a main artery for goods-in-process. Any interruption of this flow results in waste right down the line. Preventive maintenance can assure smoother and faster production.

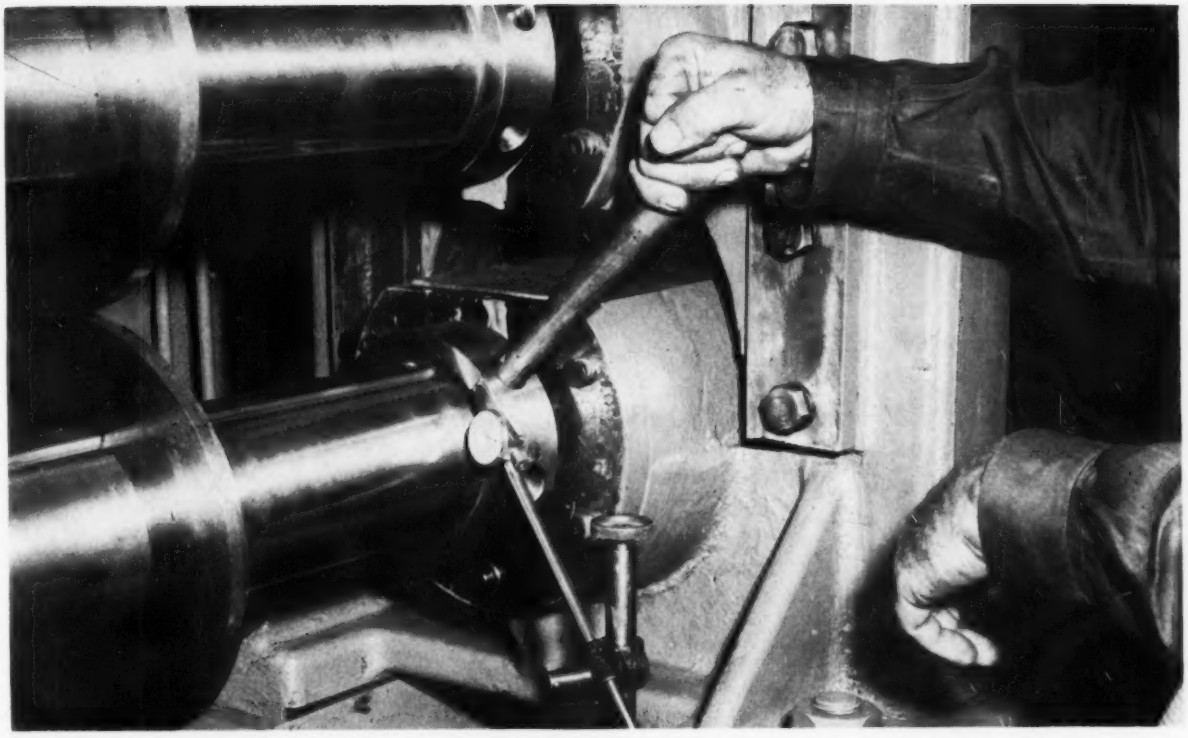
Word of Caution—Before considering some of these maintenance factors, one point should be stressed. For those who plan to purchase coil processing equipment: always check carefully with the manufacturer to determine the precise amount of overload the equipment can safely stand.

It's true that tolerable limits set by manufacturers on coil weights and number of cuts in each gage allow for a certain margin of safety. But don't assume that these margins apply to all makes of slitters. Just because slitter "A" can do a certain job is no reason to believe that slitter "B" can handle the same one. Remembering this, the damag-



A CLEAN JOB: Clean hands and a lint-free rag are musts for this operator in wiping the cutter.

TAKE OUT THE SQUEAKS: Thorough lubrication depends on knowing the location of each grease fitting.



PROPER ALIGNMENT: This dial indicator, measuring in ten-thousands of an inch, checks arbor alignment for proper tolerances. This checkup, if done once a year, will improve the flow of production.

ing effects of severe overloading can be ruled out.

First Steps—Check lubrication at the start of each 8-hr shift. Most slitters have individual grease fittings, although some of them have centralized lubrication systems. The location of these fittings varies not only with every make of slitter but also with every setup of the same make and model.

It's a good idea to have the manufacturer clearly indicate each fitting's position. This is a good way to avoid downtime and poorer performance.

Cutters, spacers, tooling and arbors should be protected from injury and dust while not in use. There should be a carefully planned system for storing, cataloging and maintaining cutter and spacer complements. Many slitter owners have built or purchased tooling cabinets for this purpose.

Check Air Supply—Special attention should be paid to the air and hydraulic systems. The strainer, lubricator and regulator controlling the incoming air supply should be checked, cleaned and lubricated daily.

And the entire hydraulic system should be flushed out at least once a year. The hydraulic tank can be cleaned by removing the inspection plate, then swabbing the tank through the inspection hole.

Don't exceed the hydraulic pressure specified by the manufacturer. By staying within these limits, any undue strain on cylinder packings can be avoided. And leakage and excessive oil heating will be reduced.

Keep Parts Clean—Knives and spacers must be kept clean. When arbors are being set up for each run, knives and spacers must be wiped clean and freed of nicks. Use clean hands and lint-free rags for the cleaning operation.

To remove nicks, work with a superfine, dry stone. Don't use a solvent. Any nicks left on the knives will cause them to wobble. This condition will lead to knife spalling, dulling of knives and a severe burr on the strip. Then, of course, tolerances will be destroyed.

Other Fast Rules—Arbors should be checked and realigned at least once a year. This will preserve the exact relationship of parallelism, shoulder alignment and end float.

Electrical contact parts should also be given a yearly check-up. In addition, daily checks should be made of electrical manufacturers' recommendations.

Care is also needed to keep the overarm separator parallel with the recoiler head to prevent dinging of the strip. This is the same separator that rides the strip and maintains counterbalanced pressure to prevent marking, while keeping the slit coils apart.

The above tips for preventive maintenance, if followed faithfully, will eliminate most sources of trouble in all coil processing installations.

Hot-Press Forging Cuts Cost Of Copper Alloy Parts

By A. I. Heim—Research Director, Copper & Brass Research Assn., New York

Often the process that seems most costly at the outset will be the cheapest in the long run.

Here are several cases where forging produced savings in improved quality of copper alloy parts.

▪ Parts that are dense and nonporous, strong yet light in weight, readily machinable to close tolerances, and low cost in large runs: these are some of the benefits that stem from using copper-alloy hot-pressed die forgings.

The forging process often improves quality at the same time that costs are being reduced on parts, machining and assembly.

Redesign to take full advantage of a copper-alloy forging usually results in a lighter part with greater strength and toughness. In designs that call for mating or interlocking parts, the change to a single forging may do much to reduce costs and assembly time.

Twice-Wrought Metal—Formed under heavy pressure in mating die-halves, copper-alloy forgings have dense, uniform grain structures. The forging operation is actually a second working of the metal under heat and pressure, since forging blanks are cut from extruded rod or bar.

Thus, being twice-wrought, die-pressed forgings are free of porosity and other internal defects.

With smooth external and internal surfaces, and dimensions conforming closely to die surfaces, copper-alloy forgings need little machining and finishing. Often the only work needed, in addition to drilling, tapping or threading, is on mating surfaces of parts.

For Fast Machining — Copper-alloy forgings permit high machining rates and the use of highly automated machining equipment. This is largely because of their consistent size, sound and uniform grain structure and the absence of inclusions. Since tool wear is moderate, close tolerances are easy to hold and the number of stops for tool grinding is sharply reduced.

Dimensional accuracy of copper-alloy hot-pressed forgings is evidenced in trouble-free use of drilling jigs, threading or milling fixtures, broaching vises and similar holding equipment for secondary operations. Die-pressed forgings are ideally suited to high-speed automatic chucking machines.

For parts in which lettering or numerals are desired, either depressed or in relief, the clean-cut, sharply defined lines of the die provide clear, legible impressions.

Typical Savings—Big machining cost savings often result. When Automatic Sprinkler Corp. of America, Youngstown, switched its "400" ceiling sprinkler heads to a copper-alloy forging, machining costs were cut 33 pct.

Prior to that time, rejects had been running as high as 10 pct because of porosity. The copper-alloy forged body virtually ended rejects and led to a 40-pct cut in material costs. The overall savings come to about 39.5 pct.

In the sand casting formerly used, excess metal at the inlet end had been removed by machining. Multiple boring was required at the outlet end. Moreover, four lugs around the outside of the body had to be machined.

Now, much of this work is no longer necessary. And the as-forged lugs in the redesigned sprinkler body are satisfactory without further finishing. The company also reports that an orifice seat, the important water-seal surface within the sprinkler body, is now being machined with greater precision.

Sound Under Pressure—Important savings can often be achieved when parts can be set up for automatic turning or automatic machining equipment. This is what happened at Smith Welding Equipment Corp., Minneapolis.

Gas pressures ranging up to 2400 psi must be contained by welding regulators. Smith regulator bodies made of copper-alloy hot-pressed forgings have been tested up to 6000 psi without any failures. Soundness under extreme pressures is attributed to the high density and proper grain structure of the forged brass regulator bodies.

These bodies are subject to drilling, tapping, reaming, turning and milling. Much of the turning work is handled in high-output five-station chucking machines. The balance is done in turret lathes and hand-operated screw machines.

Key in Support—Accuracy and close tolerances in these automated operations depend on proper support in jigs and fixtures. This is no problem, since the forged part closely matches the internal shape of the die.

It's a situation in which forging die life is a factor. A simple closed set of dies will produce 30,000 to

40,000 forgings before tooling must be renewed.

Dies in which a punch is surrounded by hot metal, as in many extrusion dies, will produce 12,000 to 15,000 pieces. Die life depends, in general, on complexity of the forging. The simpler the forging, the longer the die can be expected to last.

For Short Runs, Too — Sometimes, it's possible to reduce die cost for a given part. One welding regulator in the Smith line was needed in smaller quantities than the standard regulator bodies. Yet this part was to operate at outlet pressures up to 2000 psi in service. The part had to be strong and dense, and a forging was indicated. The high cost of dies for the comparatively short run was the problem.

To solve it, the company designed this regulator body with the same external shape and dimensions as one of its standard bodies. Thus, the forging supplier was able to make use of the external die-half from the standard forged body.

Only the internal die-half for the new forging had to be made, and the cost was a good bit lower than for a complete set of dies. Die costs were recovered in a rather short run, yet there was no loss of product quality or value.

Ends Thread Stripping—Liquids, hot or cold, corrosive, erosive and viscous, are handled in a line of automatic fluid control valves made by Annin Co., Los Angeles. These valves actuate the automatic controls in chemical, petroleum, papermaking, steam power and related industries.

An automatic positioning mechanism in the valve is called a gage block. This part houses the main actuating valve and serves as a mounting for valve pressure gages.

Originally, the part was an aluminum casting; and holes would develop in the heavy screw threads as a result of the anodizing treatment. Thread stripping in service

Copper Alloys for Hot-Press Forging

The Common Types and What They'll Do

	Electrolytic Tough Pitch Copper	Deoxidized Copper	Muntz Metal	Forging Brass	Naval Brass	Leaded Naval Brass	Manganese Bronze (A)	High Silicon Bronze (A)	Aluminum Silicon Bronze	Nickel Silver 45-10
PHYSICAL PROPERTIES										
Density, lb/cu in. at 68°F	0.321	0.323	0.303	0.305	0.304	0.305	0.302	0.308	0.278	0.306
Melting Point (solidus), °F	1949	1980	1650	1620	1630	1630	1580	1780	1810	1715
Coefficient of Thermal Expansion per °F, x 10^7	98	98	116	115	118	118	118	100	92	90
Thermal Conductivity, Btu/sq ft/ft/hr/°F at 68°F	226	196	71	69	67	67	61	21	22	27
Electrical Conductivity, pct IACS at 68°F	101	85	28	27	26	26	24	7	7	10
MECHANICAL PROPERTIES										
Tensile Strength, 1000 psi[1]	33	33	58	58	64	62	72	52	83	83
Yield Strength (½ pct extension under load), 1000 psi[1]	11	11	21	23	26	24	34	18	41	36
Elongation in 2 in., pct[1]	45	40	48	40	40	40	33	70	35	25
Hardness (filed surface, ⅛ in. chord minimum),										
Rf scale	37	37	.....	.....	.....	.....	.....	.....	.....	.....
Rb scale	.....	.....	46	45	55	55	69	62	77	73
FABRICATING PROPERTIES										
Relative Forgeability Rating, pct[2]	65	65	90	100	90	90	80	40	75	85
General Rating for:										
Hot Working	E	E	E	E	E	G	E	P	F	E
Cold Working	E	E	F	P	F	P	P	E	P	P
Soft Soldering	E	E	E	E	E	E	E	G	F	E
Brazing	G	E	G	G	G	G	G	G	F	G
Welding										
Gas	P	F	G	F	G	F	G	E	F	G
Carbon Arc	F	G	F	P	F	P	F	E	F	G
Resistance	P	P	F	P	F	P	G	E	F	G
Machinability, pct[3]	20	20	40	80	30	70	30	15	55	40
Average Forging Temp., °F	1500	1500	1400	1400	1400	1400	1400	1600	1500	1400

Note: Properties listed are average values suitable only for general engineering use; they're not intended as a basis for specifications.
[1] Obtained from 0.505 in. test sections.
[2] Based on general opinion, considering such variables as pressure, die wear and plasticity, then related to the most generally used alloy, forging brass, equaling 100 pct.
[3] Related to free-cutting brass rod equaling 100 pct.

As-Forged Tolerances Cut Down on Finishing

Small Forgings (Weight up to 2 lb incl.)*	Copper	Muntz Metal	Forging Brass	Naval Brass	Leaded Naval Brass	Manganese Bronze (A)	High Silicon Bronze (A)	Aluminum Silicon Bronze	Nickel Silver 45-10
FORGING TYPES:									
1. Solid	0.010	0.008	0.008	0.008	0.008	0.008	0.012	0.010	0.008
2. Solid, with symmetrical cavity	0.010	0.008	0.008	0.008	0.008	0.008	0.012	0.010	0.008
3. Solid, with eccentric cavity	0.012	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.008
4. Solid deep extrusion	0.012	0.010	0.010	0.010	0.010	0.010	0.014	0.012	0.010
5. Hollow, deep extrusion	0.012	0.010	0.010	0.010	0.010	0.010	0.014	0.012	0.010
6. Thin section, short, (Up to 6 in. incl.)	0.012	0.010	0.010	0.010	0.010	0.010	0.014	0.012	0.010
7. Thin section, long, (Over 6 to 14 in. incl.)	0.015	0.015	0.015	0.015	0.015	0.015	0.020	0.015	0.015
8. Thin section, round	0.012	0.010	0.010	0.010	0.010	0.010	0.014	0.012	0.010
DRAFT ANGLES									
Outside and inside, 1° to 5°	½°	½°	½°	½°	½°	½°	½°	½°	½°
MACHINING ALLOWANCE									
(On one surface)	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32
FLATNESS									
(Maximum deviation per in.)	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
CONCENTRICITY									
(Total indicator reading)	0.030	0.020	0.020	0.020	0.020	0.020	0.030	0.030	0.030
NOMINAL WEB THICKNESS	5/32	1/8	1/8	1/8	1/8	1/8	3/16	5/32	1/8
Tolerance	1/64	1/64	1/64	1/64	1/64	1/64	1/64	1/64	1/64
NOMINAL FILLET & RADIUS	3/32	1/16	1/16	1/16	1/16	1/16	1/8	3/32	1/16
Tolerance	1/64	1/64	1/64	1/64	1/64	1/64	1/64	1/64	1/64
APPROXIMATE FLASH THICKNESS	1/16	3/64	3/64	3/64	3/64	3/64	5/64	1/16	3/64

* For tolerances on heavier forgings consult forging suppliers.
All tolerances are plus and minus; if tolerances all plus or all minus are desired, double the values given. (In inches except as shown).

was a common occurrence. The problem was serious.

Then the company turned to a brass forging for the gage blocks. There's no more thread stripping, less time is put in on machining, and the forgings offer a better surface finish for plating.

Tips on Design—Virtually any part can be produced as a copper-alloy hot-pressed forging. But it's wise to consult a forging supplier at an early stage in design.

In designing a forged part, allow for the shrinkage that results from cooling of the metal in the dies during the forging process. Proper draft angles must be provided to permit release of the forging from the dies.

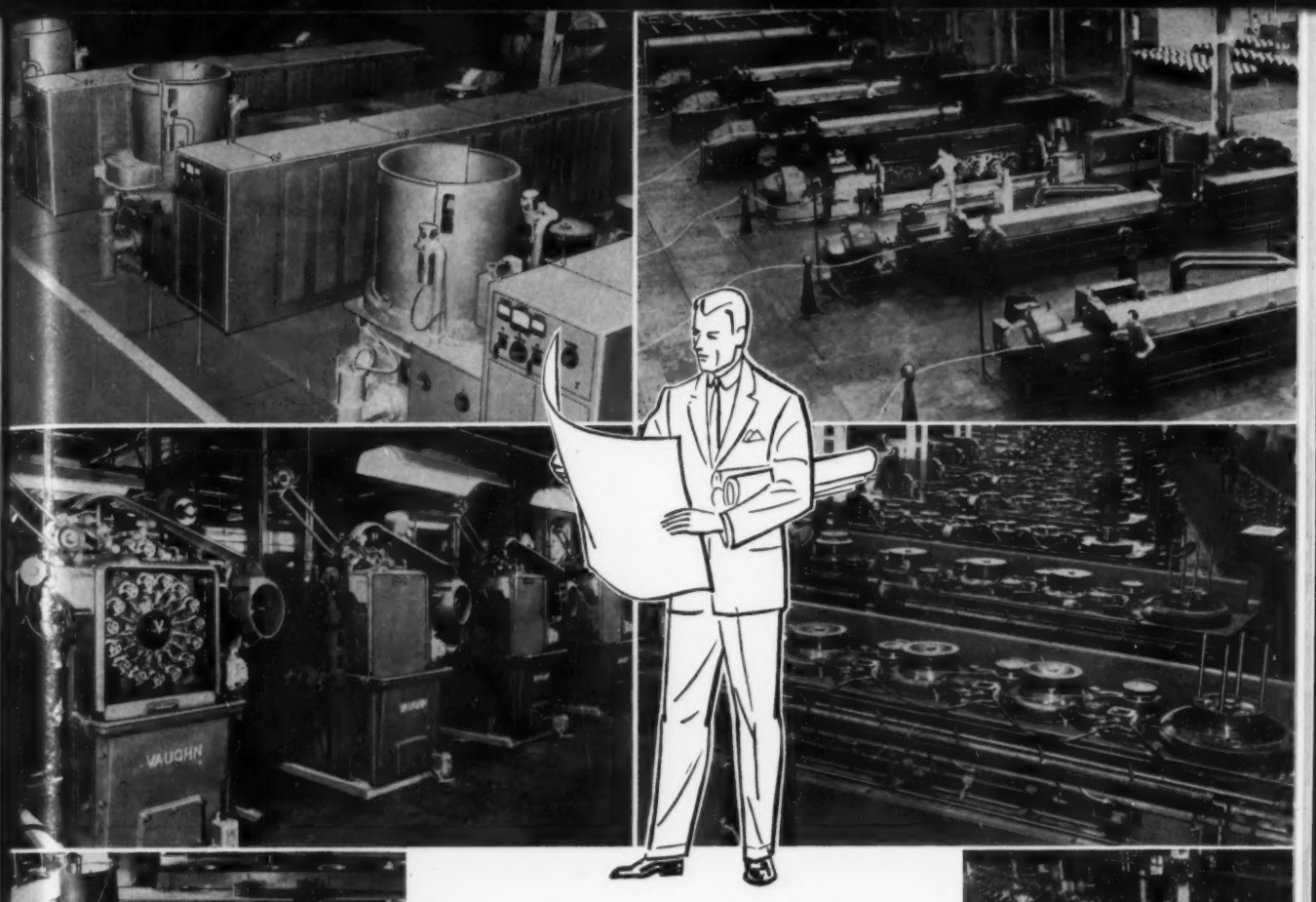
This angle is generally put at 1° to 5°. Proper fillets at both inside and outside corners help assure adequate strength. They also help prolong die life.

Care must be taken to avoid necking down of cavity walls. Nor must the walls be placed so close together as to prevent free flow of metal during the forging stroke. Undercuts and traverse cavities must be avoided if possible to keep die costs down.

Watch Your Specs—Don't specify closer tolerances than are actually needed. Maintaining dies to produce forgings with such tolerances during production is costly.

In choosing a forging alloy, consider what types of secondary operations may be necessary to finish the part. Most copper alloys used in hot-press forging are well suited to machining, drilling and tapping, milling or knurling; they're also suitable for joining by many brazing, soldering and welding methods.

Finishes such as organic coatings or electroplating work well on copper-alloy forged parts. Electroplated coatings may be applied without prior buffing and polishing; but for high-luster finishes, these operations should be used.



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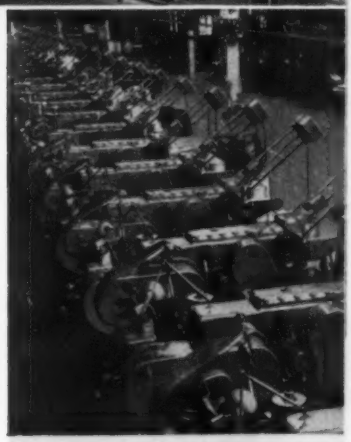

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Vaughn engineering is at your service in many helpful ways—from consultations on your preliminary planning to the final layout of wire room equipment . . . for the most effective utilization of today's high speed wire drawing equipment. As a beginning, why not have a Vaughn engineer sit down with you and check over the many advances in design and operation achieved by Vaughn equipment in just the last three years? No obligation whatever—and you'll gain by it!

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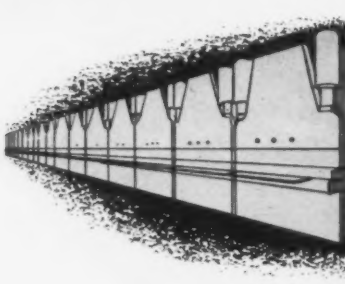


4,769 years to arrive ACCURATE HYDRAULIC

122 out of 124 hydraulic press brakes in U.S. aircraft industry are PACIFIC

Aircraft manufacturers work to the closest tolerances of all industries in metal forming. Douglas Aircraft Company, Tulsa, Oklahoma, with 8 Pacific Brakes (above) is typical of the airframe manufacturers who have selected Pacific for its precise accuracy.

924 PACIFIC Brakes, representing over 95% of all hydraulic press brakes in use today, have operated for an aggregate of 4,769 years to test and confirm PACIFIC designs that have established hydraulic press brakes as far more profitable to operate than mechanical brakes. However, only PACIFIC has precise accuracy, versatility, high speed and dependability that comes from years of experience in manufacturing, developing and improving this unique machine. It is the only hydraulic press brake in daily operation that is actually air bending, straightening, deep drawing, blanking, and doing heavy punching. Accuracy within thousandths of an inch (greater than with any mechanical or other hydraulic brake) repeats itself on every stroke. Ram remains level regardless of location of work on the bed. PACIFIC sizes range from 60 tons to 1500 tons.

PACIFIC HYDRAULIC

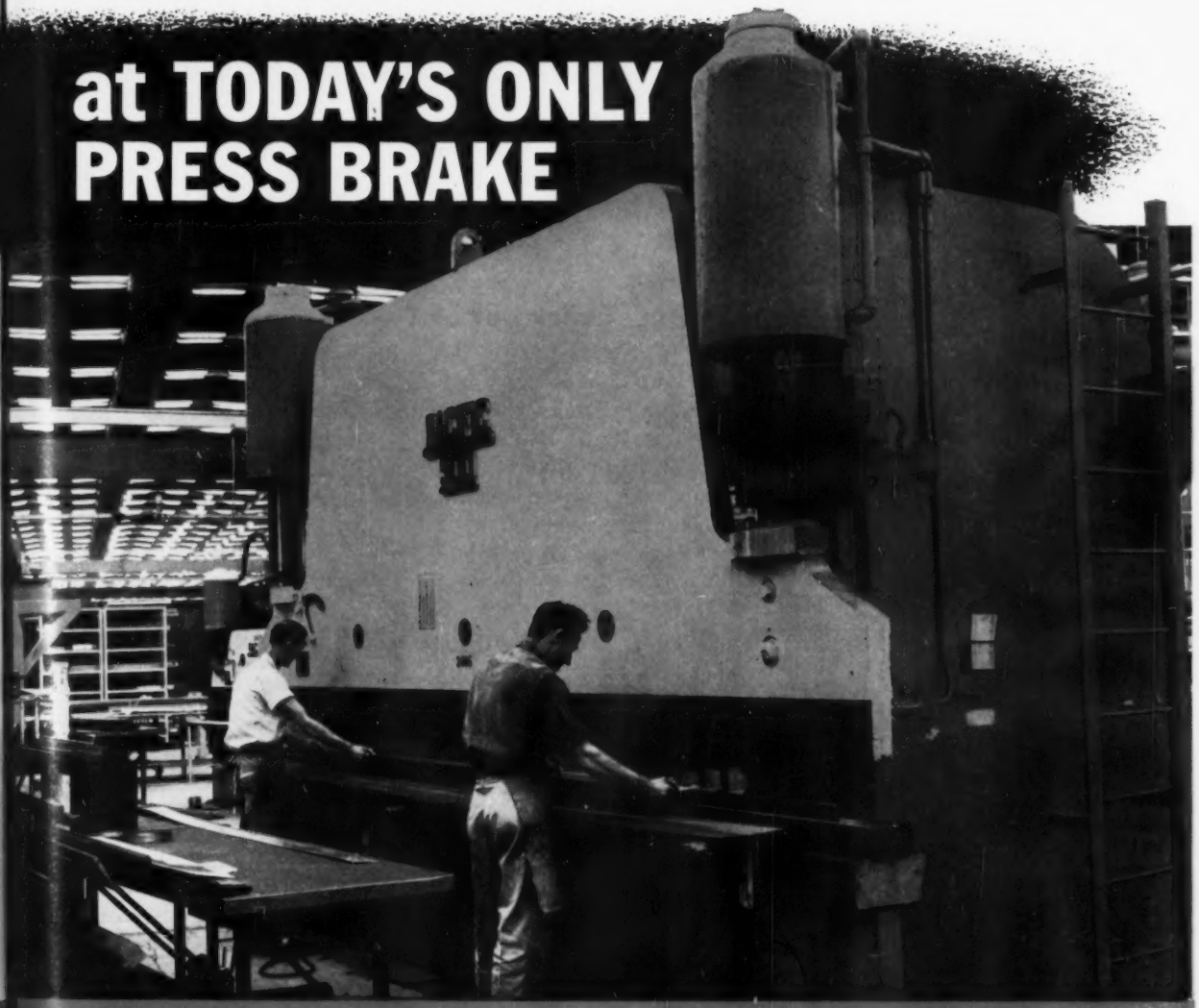
Only hydraulic brake built for HEAVY PUNCHING

Pacific is uniquely designed to absorb heavy shock from punching in the hydraulic system rather than in the frame of the brake. Cushioned against shock, punch and dies stand up from 3 to 8 times longer than with mechanical brakes. Photo (above) shows 1" alloy steel plate being punched at earthmoving equipment plant.

MAINTENANCE-FREE for years

Dependable, simplified electrical and hydraulic controls can easily be kept working continuously by any plant maintenance crew. There are no complicated electronic devices. In photo (above) at agricultural equipment plant, the 500 ton Pacific Hydraulic Brake shearing ¾" alloy steel plate with Pacific Shearing Attachment has operated continuously for the first 4 years at a cost of $5.22 in replacement parts.

at TODAY'S ONLY PRESS BRAKE



PRESS BRAKE

HIGH SPEED operation

Pacific adjustable stroke length can be shortened for rapid stroking. Automatic, self-leveling ram permits use of progressive dies across entire bed of press. The automatically-fed Pacific at automotive parts plant, which can cycle up to seventy 1½" strokes per minute, is forming 3780 operations per hour in the above photo. In virtually any operation, Pacific's high cycling speed equals or exceeds materials handling capacity.

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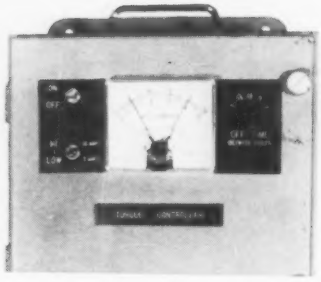
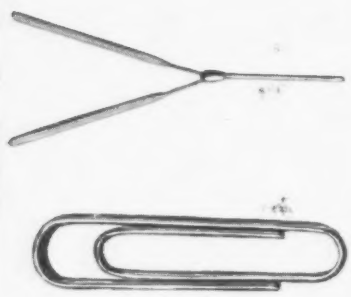
New Materials and Components



Takes Guesswork out of Torque Operations

A new torque control takes the guesswork out of critical production or testing operations involving torque, by making accurate torque force measurements automatically, and shutting off power equipment at the optimum point. It can be used to prevent tool damage, insure proper degree of nut tightening, or act as an alarm in automatic production processes in which torque is produced by electric motor drives. It utilizes drive-motor current as the measurement factor. (TrippTronic, Inc.)

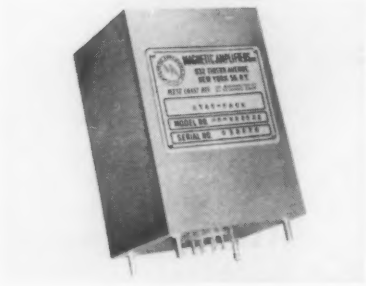
For more data circle No. 1 on postcard, p. 91



Tiny Strain Gage for Elevated Temperatures

Having a diameter of only 0.012 in. with completely insulated coating, this strain gage is suitable for insertion into the exact axis of aircraft, explosive, or other type bolts. It may also be used in special applications such as notches, corrugations, and ligaments. Its special virtue is the ability to withstand elevated temperatures. With proper insulating coatings operating ranges from —325° to 2000°F may be obtained. It is available in 60- and 120-ohm sizes in standard types of strain-sensitive wire and in the manufacturer's special temperature-resistant alloys. (High Temperature Instrument Corp.)

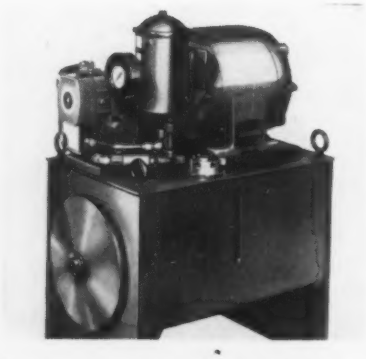
For more data circle No. 2 on postcard, p. 91



Switches Fast in Process-Control Applications

A solid-state automatic-control switch weighing only 9 oz, containing no moving parts, and having virtually unlimited life is capable of regulating complex industrial manufacturing processes at a speed of 1000th of a second. Outlasting the equipment it regulates, it can replace electromechanical relays in complex control systems. A high-performance magnetic amplifier, it can control power, open and close circuits, transmit actuating signals, and perform computer logic functions. It will also check and verify results. (Magnetic Amplifiers, Inc.)

For more data circle No. 3 on postcard, p. 91

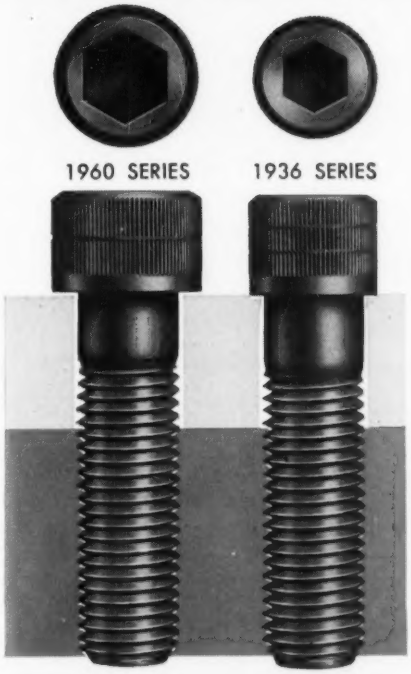


Inexpensive 10-gal Hydraulic Power Package

Compact, versatile, and economical, a new unit provides hydraulic power and control for a wide variety of industrial uses requiring low hydraulic power, such as gaging, transferring, rollover, elevating, indexing, chuck and clutch operations, etc. The basic reservoir, which occupies only 25 x 14 in., is regularly equipped with clean-out covers, fluid - level indicators, breather, filter, baffle, and drain plug. Optional features include a return-line filter with check valve, a pressure-line bypass filter, extra breather, extra oil-level indicators, etc. Maximum recommended motor size is 3 hp. (Vickers, Inc.)

For more data circle No. 4 on postcard, p. 91

Allen's *New '60 Series* Socket Head Cap Screws



give up to 2⅓ times more load carrying capacity ...without indentation!

In Allen's new '60 Series, head diameter of sizes from ¼" up is now uniformly one and one-half times the body diameter. In many sizes (where this ratio was not called for by 1936 Series specifications) this will provide *more* under-the-head bearing surface, and a proportionate *increase* in clamping force. Loads are more evenly distributed, and the greater bearing area in many cases eliminates need for washers.

Socket sizes have been increased in many cases—greater wrenching area permits higher tightening torque—which resists fatigue failure, and lengthens the life of the threaded joint.

- A new 2-band knurl will identify all ALLEN Cap Screws (except Stainless Steel) that conform to the new '60 Series specifications. New labels on boxes will also identify these.
- The 1936 Series of Allen Cap Screws will continue to be available.

COMPARISON OF ALLEN 1960 SERIES AND 1936 SERIES SOCKET HEAD CAP SCREWS

SCREW SIZE	HEAD DIAMETER Minimum (Inches)		BEARING SURFACE Minimum (square inches)		PERCENT OF INCREASE IN BEARING SURFACE[1]	TENSILE LOAD TO INDENT IN SOFT STEEL[2] (lbs.)		TORQUE INDUCED TENSILE LOAD TO INDENT IN SOFT STEEL[2] (lbs.)	
	1960 Series	1936 Series	1960 Series	1936 Series		1960 Series	1936 Series	1960 Series	1936 Series
¼	.365	.367	.044	.044	—	4,750	4,750	2,780	2,780
5/16	.457	.429	.070	.052	33	7,440	5,600	4,380	3,300
⅜	.550	.553	.111	.111	—	12,100	12,100	7,000	7,000
7/16	.642	.615	.140	.103	36	15,000	11,000	8,850	6,450
½	.735	.739	.183	.183	—	19,500	19,500	11,500	11,500
9/16	.921	.863	.293	.216	35	31,000	23,200	18,500	13,600
¾	1.107	.987	.424	.224	89	45,000	24,000	26,700	14,100
7/8	1.293	1.111	.585	.253	131	62,500	27,000	36,800	15,900
1	1.479	1.297	.768	.405	89	82,000	43,500	48,500	25,500

[1]Head tolerance revisions on Sizes #0 thru #10, ¼, 5/16, and ½ diameter have no significant effect on bearing surface or holding power of screws.
[2]Values based on .00025 inch indentation.

Ask your Industrial Distributor about ALLEN '60 Series Cap Screws.
Write for samples and complete specifications. Ask for Bulletin G-25.

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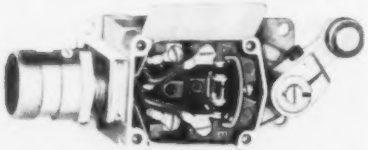
ALLEN HEAD HEX-SOCKET SCREWS

DESIGN DIGEST

Plug-In Limit Switch

A heavy-duty oil-tight limit switch features a "power plug" which permits replacement without



disturbing wiring. It is necessary only to remove the four mounting screws, disconnect the power cable with the threaded coupling, and lift off the switch. (Square D Co.)

For free copy circle No. 5 on postcard, p. 91

Vanadium Additive

A vanadium additive for titanium alloys is about 75 pct vanadium, balance titanium with small percentages of other metals, and very low in oxygen and nitrogen. Free from aluminum, it is recommended for incorporation in titanium alloys where the use of aluminothermic vanadium is unsatisfactory. Available for sale are trial quantities in fine crystal form, well suited to incorporation in consumable electrodes. (Chicago Development Corp.)

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Protective Coating

An inorganic zinc coating provides high galvanic protection to steel, and eliminates sub-film rusting in salt-water, fresh-water, and solvent environments. Effective from –80° to 750°F, it can be used as a single-coat protection or as a prime coat for all types of topcoats. Quick drying, it is easy to apply in adverse environments and where time is at a premium. (Carboline Co.)

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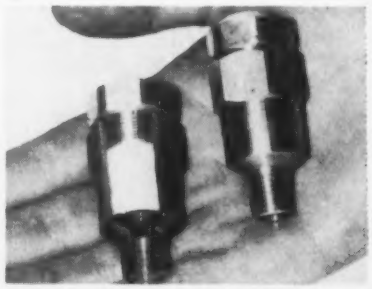
Compressed-Air Filter

A small lightweight filter embodying a filter cartridge with 5-micron capacity filters compressed air systems of small instruments, checking gages, valves, etc. to pre-



vent damage from sludge, rust, and dust. It is fitted with ¼-in. pipe threads, one end male, the other female. (Wilkerson Corp.)

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Liquid-Oxygen Pump

A special pump is available, designed for handling low-temperature liquids, such as liquid oxygen, at —297°F. (Worthington Corp.)

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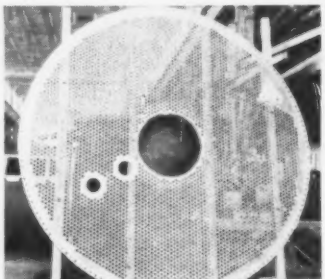
We have equipment capable of boring, turning and facing a casting up to 16 ft. in diameter. Our planers can easily finish work up to 16 ft. in length on 60 in. open side tables. Drill presses, with up to 7 ft. arms, handle adequately the drilling of large castings.



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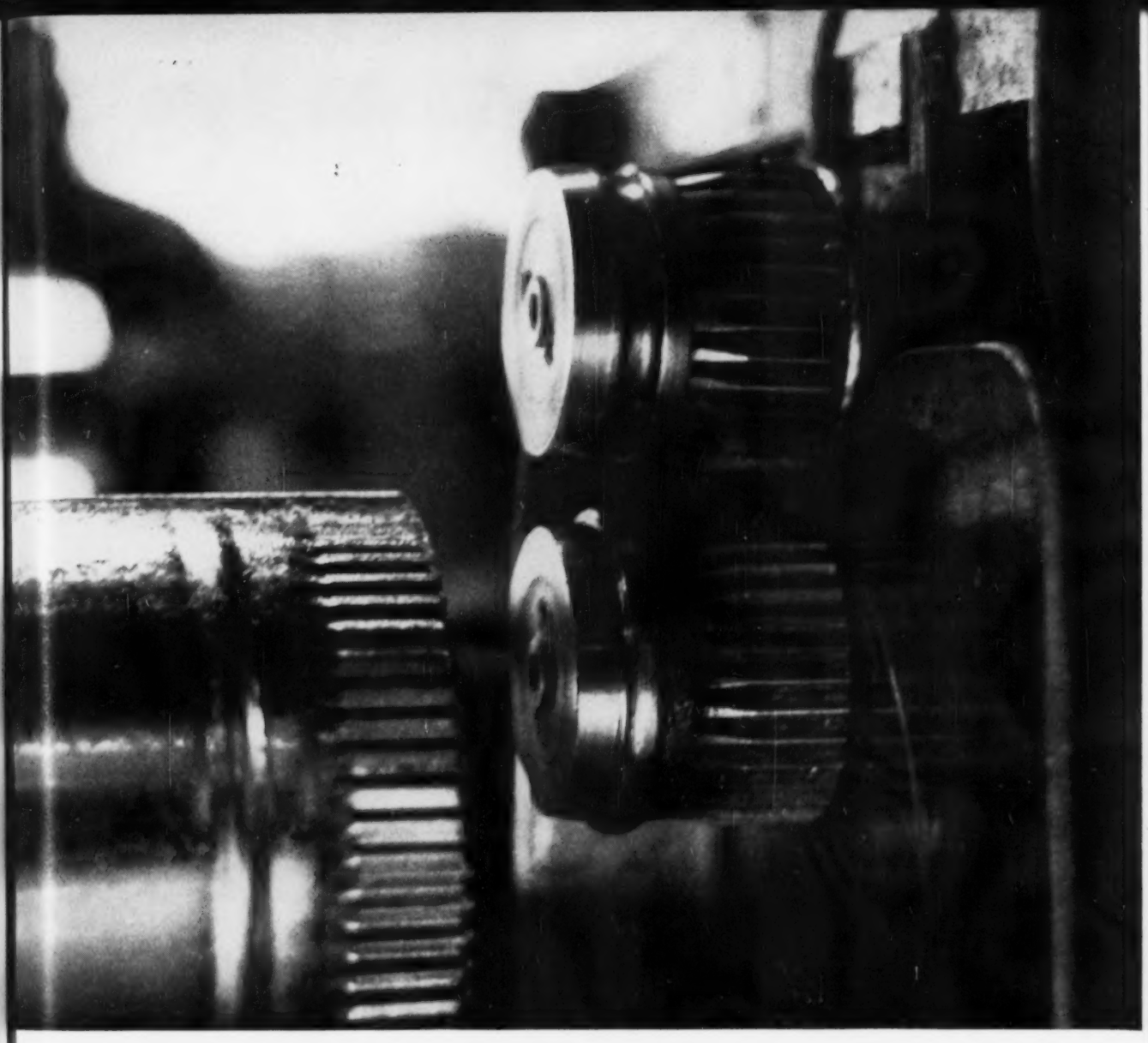

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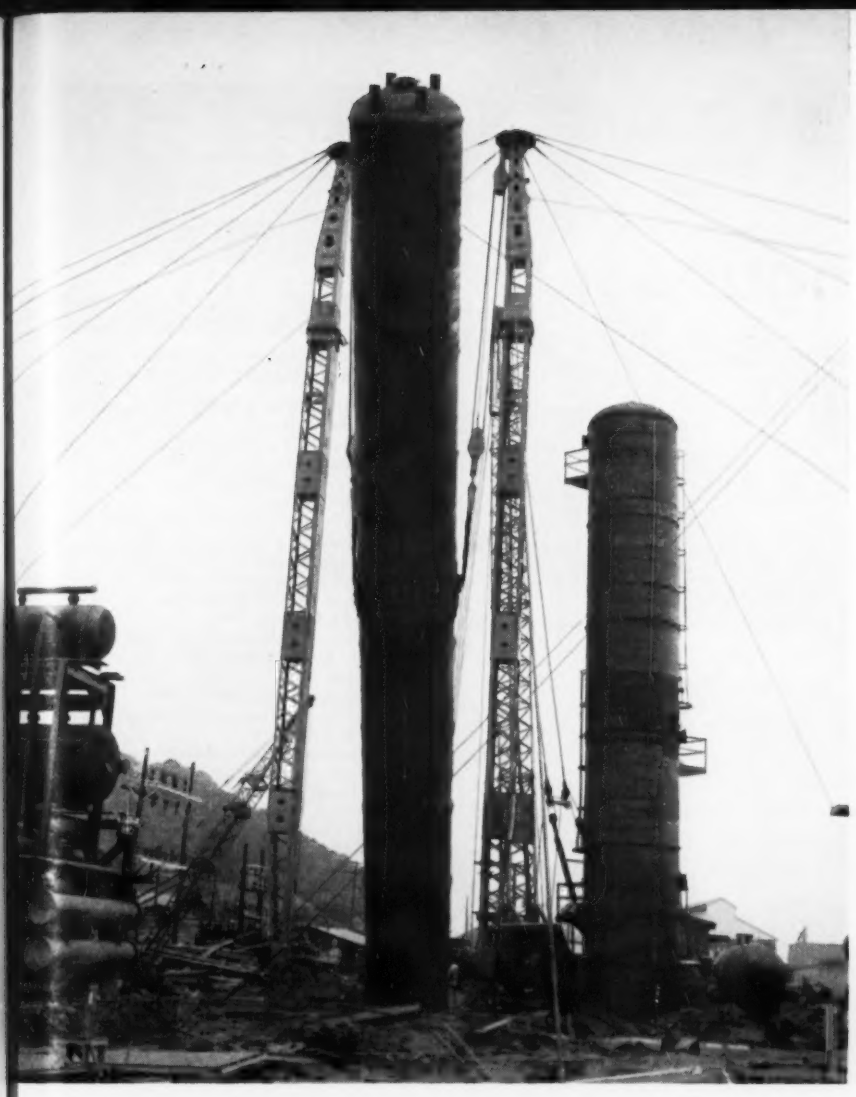

UP...ALL IN ONE PIECE!

Here's how J. F. Pritchard & Company, Kansas City, Mo., erected this 340,000 lb., 102'-6" extractor in one piece

The world's largest absorber will soon be in operation at the Hydro-carbon Extraction Facilities for United Fuel Gas Company of Charleston, West Va. Heart of the facility is the absorber vessel weighing 170 tons and measuring 102'-6"x 14' in diameter. To set this giant vessel upright, Pritchard used two 125-ton masts and Skagit hoists equipped with Yellow Strand Wire Rope. Pritchard selected two Yellow Strand Braided Safety Slings 49' long made of 8 parts of 1⅛" wire rope to cradle the absorber as it was lifted and placed in position.

When valuable equipment—even *lives*—depend on flawless performance of wire rope, be sure it's Yellow Strand!

Broderick & Bascom Rope Co., 4203 Union Boulevard, St. Louis 15, Mo.

Yellow Strand®

WIRE ROPE SLINGS CLIPS

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 91.

Plant Location

Industrial water supplies in Pennsylvania are analyzed in an 88-page book. Many site-seekers frankly admit available water supply is number-one item for consideration. No drum-pounding promotional piece, this book merely supplies facts so management can compare and make an intelligent decision. Water means more than supplies, wells, and pipelines: it means populated areas, labor markets, waterways, ports, waste disposal, and related assets (related disadvantages, too). (Commonwealth of Pennsylvania, Dept. of Commerce)

For free copy circle No. 11 on postcard, p. 91

Weighing System

Five basic types of hydraulic weighing cells, with 5000-lb capacity, are described in an eight-page brochure, along with instrumentation components used with them, for use in weighing systems. (The A. H. Emery Co.)

For free copy circle No. 12 on postcard, p. 91

Shell Drawing

Facilities and procedures offered by a company for drawn metal shell production are described in a series of bulletins. Contract production runs from eyelets to intricate parts. (Cly-Del Mfg. Co.)

For free copy circle No. 13 on postcard, p. 91

Screw Products

Specifications and prices on a complete line of screws, bolts, and nuts are presented in an eight-page catalog (available to distributors and retailers who request Catalogue P-1 by writing on company letterhead to Southern Screw Co., P. O. Box 1360, Statesville, N. C.)

Multiple-V Belts

A description and specifications on a line of endless rubber belts with parallel V-ribs are presented in a bulletin. The line is especially designed for high-speed, small-pulley (¾-in. and up) applications. Advantages include compactness, positive tracking, and constant pitch. (Raybestos-Manhattan, Inc.)

For free copy circle No. 14 on postcard, p. 91

Electrical Alloy

Technical data is available on a copper alloy with zirconium added to improve high-temperature mechanical properties, and designed for electrical applications. Immediate uses are seen in slip rings, resistance-welding electrodes, battery terminals, etc. Many other uses are foreseen. It is available in round rod and wire from 0.028- to 1-in. diam. Rod is stocked from ¼ in. in coils or 10- to 12-ft lengths, to ⅞ in. in 10- to 12-ft lengths. (Bridgeport Brass Co.)

For free copy circle No. 15 on postcard, p. 91

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Atlas Foundry Co., Detroit, Mich.
Banner Iron Works, St. Louis, Mo.
Barnett Foundry & Machine Co., Irvington, N. J.
Blackmer Pump Co., Grand Rapids, Mich.
Centrifugally Cast Products Div., The Shenango Furnace Co., Dover, Ohio
Compton Foundry, Compton, Calif.
Continental Gin Co., Birmingham, Ala.
The Cooper-Bessemer Corp., Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co., Portland, Ore.
Dayton Casting Co., Dayton, Ohio
Empire Pattern & Foundry Co., Tulsa, Okla. and Bonham, Texas
Florence Pipe Foundry & Machine Co., Florence, N. J.
Fulton Foundry & Machines Co., Inc., Cleveland, Ohio
General Foundry & Mfg. Co., Flint, Mich.
Georgia Iron Works, Augusta, Ga.
Greenlee Foundries, Inc., Chicago, Ill.
The Hamilton Foundry & Machine Co., Hamilton, Ohio
Hardinge Company, Inc., New York, N. Y.
Hardinge Manufacturing Co., York, Pa.
Johnstone Foundries, Inc., Grove City, Pa.
Kanawha Manufacturing Co., Charleston, W. Va.
Kennedy Van Saun Mfg. & Eng. Corp., Danville, Pa.
Lincoln Foundry Corp., Los Angeles, Calif.
Nordberg Manufacturing Co., Milwaukee, Wis. and St. Louis, Mo.
Palmyra Foundry Co., Inc., Palmyra, N. J.
The Henry Perkins Co., Bridgewater, Mass.
Pohlman Foundry Co., Inc., Buffalo, N. Y.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Sonith Foundries of FMC, Indianapolis, Ind.
Standard Foundry Co., Worcester, Mass.
The Stearns-Roger Mfg. Co., Denver, Colo.
Washington Iron Works, Seattle, Wash.
Dorr-Oliver-Long, Ltd., Orillia, Ontario
Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
Otis Elevator Co., Ltd., Hamilton, Ontario

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Bulletin 32— Meehanite Quality Control Assures Uniform Dependability.

Write today to Meehanite Metal Corporation, Department IA, 714 North Avenue, New Rochelle 23, N. Y.

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TAKE ANY MEEHANITE CASTING

CUT IT IN HALF

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HERE IS WHAT YOU WILL FIND

UNIFORM SOUNDNESS AND SOLIDITY through all sections regardless of complexity of design or size . . . *UNIFORM STRENGTH* properties . . . and *DIMENSIONAL STABILITY* "as cast" or hardened.

Meehanite Castings are made by a patented manufacturing process. Testing of every ladle of Meehanite® insures that engineering specifications are met. The microstructure and the quantity and form of graphite is accurately controlled within every casting and from casting to casting.

Specify Meehanite castings with confidence. There is a Meehanite foundry near you.

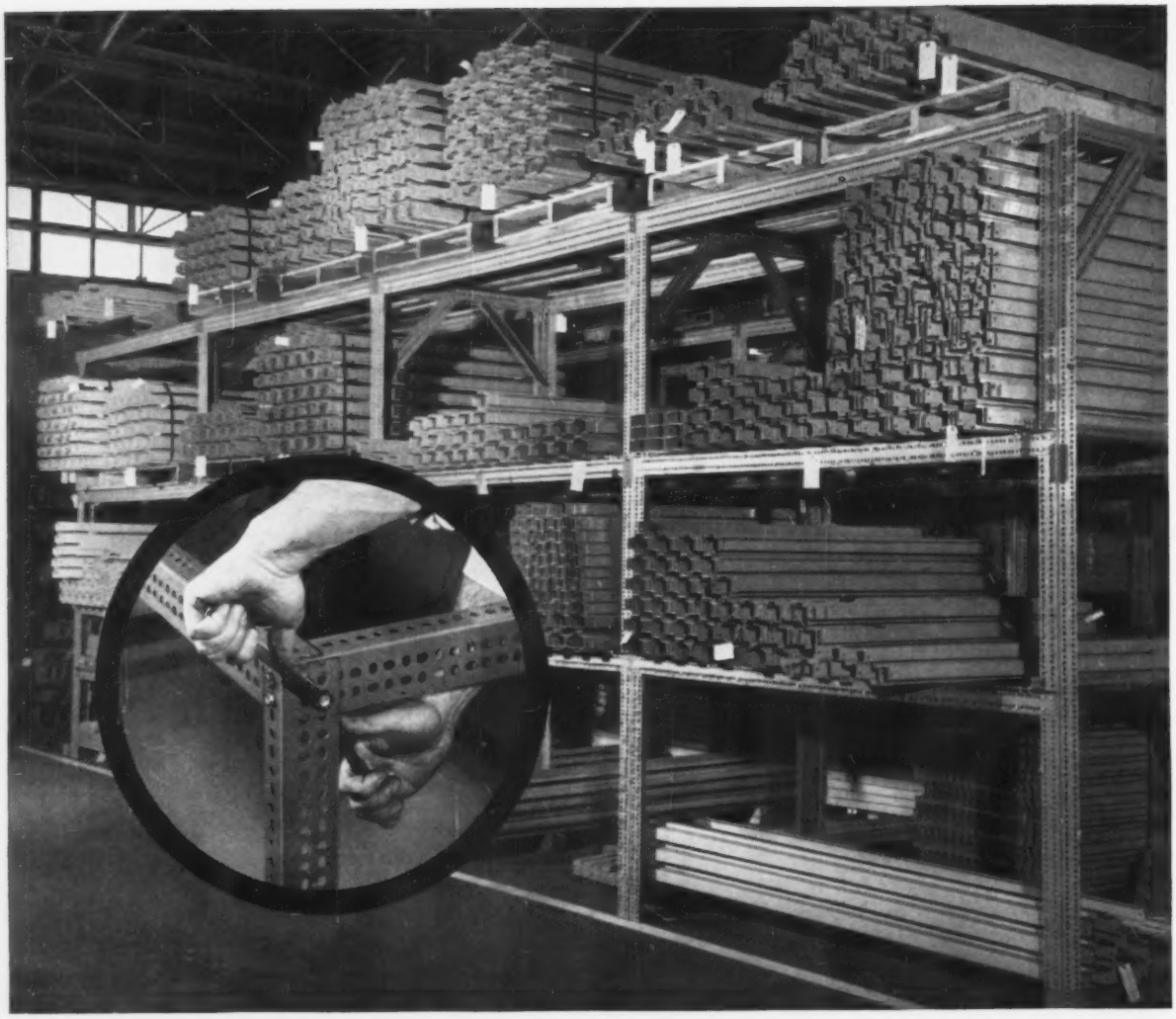
Free Literature: Bulletin 32 — Meehanite Quality Control Assures Uniform Dependability.

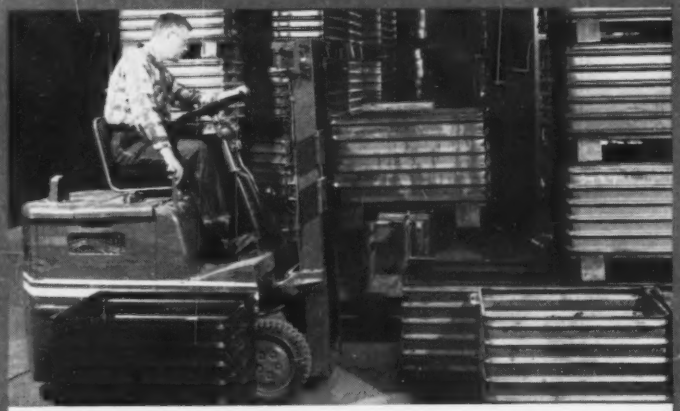
MEEHANITE BRIDGES THE GAP BETWEEN CAST IRON AND STEEL®

MEEHANITE METAL

MEEHANITE METAL CORPORATION

NEW ROCHELLE
NEW YORK





REPUBLIC MATERIALS HANDLING EQUIPMENT saves time at Signode Steel Strapping Company, Glenview, Illinois. At Signode, Republic Stacking Boxes are filled with finished parts, stacked high for production assembly or shipment. Stacking does not damage the boxes. Heavy-duty stacking brackets and corrugated box construction deliver long, efficient service at low per-year cost. Send for information.

REPUBLIC STEEL PALLET RACKS save space, simplify palletizing, stacking of bulky, uneven, odd-lot, and fragile materials. Tubular steel supports adjust every six inches to handle material to any height. Two-way entry permits loading and unloading from either side. Write today.

Republic METAL LUMBER

..."imagineering" in steel framing assemblies

Republic METAL LUMBER® is the answer to erecting fast, economical, framing assemblies. It is as easy to use as common lumber. Yet, stronger . . . because it is heavy gage steel.

METAL LUMBER is engineered with a scientifically designed pattern of slots arranged on ¾" centers. Even complicated framing problems are easy because this unique system of short longitudinal and transverse slots makes possible an unlimited number of straight and angular assembly combinations.

METAL LUMBER is ideal for erecting storage racks, work benches, catwalks, ramps, ladders, and other framing assemblies tailored to your particular needs.

METAL LUMBER is fabricated at Republic's Berger Division. Made of heavy gage steel for maximum strength and rigidity. Bonderized after fabrication. Finished in gray baked-on enamel. Available in packages of convenient lengths, and in two heavy gages. Delivered complete with bolts and nuts for assembly.

METAL LUMBER is never obsolete. Its cut-and-join simplicity makes quick assembly possible with unskilled labor. When one setup is no longer needed, it can be torn down and converted into a new and useful unit. No scrap loss—even the smallest piece can be used as a cleat or splice.

Republic METAL LUMBER provides complete flexibility for your "imagineering." Simply plan, cut, and assemble. An attractive 20-page brochure tells you how.

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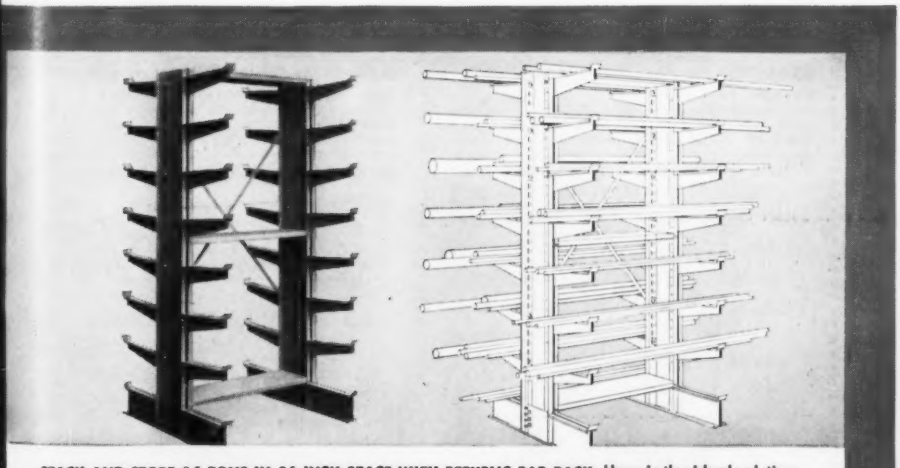

STACK AND STORE 14 TONS IN 36-INCH SPACE WITH REPUBLIC BAR RACK. Here is the ideal solution in a practical, economical way to stack and store bars, pipes, rods, any elongated stock. Load and unload from either side. Engineered and designed for shop convenience. Arms are adjustable on 2-inch centers. Each arm supports full ton of bar or pipe type material. Republic's Bar Rack Double-Face Starting Unit is 78" high, 36" wide, and 33" deep at the base. Send coupon.

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Please send information on the following Republic products:
☐ Republic METAL LUMBER brochure ☐ Republic Steel Pallets
☐ Materials Handling Equipment ☐ Republic Bar Rack
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by eddy currents and magnetic fields

In this exciting, relatively recent field of nondestructive testing, new uses and applications are being discovered and developed continuously.

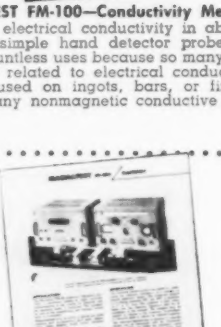
As exclusive licensee in the U. S. for Dr. F. Foerster, Magnaflux Corporation offers what is probably the widest range of eddy current testing instruments available in this country.

They are sold under the name

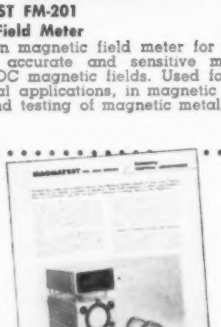
MAGNATEST

Listed below are only a few of these instruments. You may like additional information or facts for exploration, together with some knowledge of their present uses. Write for data sheets on any of the Magnatest instruments mentioned. Also, we have numerous technical translations on eddy current work that we can supply to you. Tell us briefly your possible application—or ask to have a Magnaflux Engineer discuss it with you.

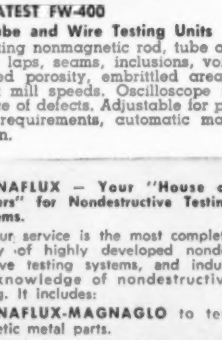
MAGNATEST ED-500
Crack Detector and Sorting Unit
A probe type eddy current meter. Detects and measures relative depth of cracks . . . sorts ferrous and nonferrous metals according to hardness, heat treat condition or alloy . . . compares relative electrical conductivity . . . may be used to "measure" coatings, sheet or film thickness.



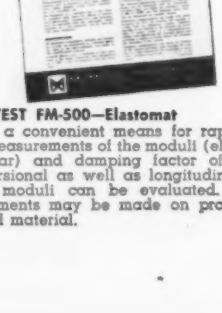
MAGNATEST FM-100—Conductivity Meter
Measures electrical conductivity in absolute units by simple hand detector probe. Has almost countless uses because so many properties are related to electrical conductivity. May be used on ingots, bars, or finished parts of any nonmagnetic conductive material.



MAGNATEST FM-201
Magnetic Field Meter
A precision magnetic field meter for making extremely accurate and sensitive measurements of DC magnetic fields. Used for many geophysical applications, in magnetic investigations and testing of magnetic metals.



MAGNATEST FW-400
Rod, Tube and Wire Testing Units
For testing nonmagnetic rod, tube and wire. Detects laps, seams, inclusions, voids, concentrated porosity, embrittled areas, "slivers" at mill speeds. Oscilloscope indicates presence of defects. Adjustable for pre-determined requirements, automatic marking or rejection.



MAGNATEST FM-500—Elastomat
Provides a convenient means for rapid, accurate measurements of the moduli (elasticity and shear) and damping factor of materials. Torsional as well as longitudinal and flexural moduli can be evaluated. Rapid measurements may be made on practically any solid material.

MAGNATEST FS-300
Magnetic Sorting Instrument
Detects changes in alloy composition, heat treat conditions . . . depth of case . . . carbon content . . . tensile strength and cold working. Also detects and measures change in mass and dimension. For use on magnetic metals. Fully automatic, if desired.

MAGNAFLUX CORPORATION
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THE HALLMARK OF *Quality* IN NONDESTRUCTIVE TEST SYSTEMS

MAGNAFLUX — Your "House of Answers" for Nondestructive Testing Problems.

At your service is the most complete variety of highly developed nondestructive testing systems, and industrial knowledge of nondestructive testing. It includes:

MAGNAFLUX-MAGNAGLO to test magnetic metal parts.

ZYGLO for nonmagnetic materials, locates cracks and pores.

SONIZON Ultrasonic Testing of thickness, laminar defects.

STRESSCOAT to find and measure high stress areas.

PARTEK to test unfired ceramics and powder metal parts.

STATIFLUX for locating defects in glass, porcelain, and non-metal coatings.

FULL INFORMATION OR CONSULTATION AT YOUR REQUEST

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Leaded Tubing

A data memorandum describes leaded C-1020 carbon-steel tubing, which retains virtually the same physical and mechanical properties and yet has machinability increased up to 90 pct, cutting speeds up to 25 pct, and feeds up to 80 pct. Tool life increases and finish is improved. It can be heat-treated and forged without hazard from the lead content. It is available in seamless form from 0.012- to 1⅛-in. OD. (Superior Tube Co.)

For free copy circle No. 16 on postcard

Titanium Products

A twelve-page technical bulletin outlines facilities for custom-working titanium, reviews its advantages and properties, and catalogs a line of titanium fasteners and special products. (Standard Pressed Steel Co.)

For free copy circle No. 17 on postcard

Spiroid Gears

"Lower Cost Design Begins with Spiroid Gears" is a comprehensive 36-page engineering manual illustrating the principle and application of Spiroid gears, a skew-axis gearing system for medium- to high-reduction ratios. (Spiroid Div., Illinois Tool Works)

For free copy circle No. 18 on postcard

TIG Arc Welders

A line of tungsten-inert-gas arc-welding machines is described in a bulletin. Usable for all manual arc-welding applications, they include dc manual electrode, ac manual electrode, dc inert gas, and ac inert gas types. (The Lincoln Electric Co.)

For free copy circle No. 19 on postcard

Industrial Gases

A 32-page booklet thoroughly covers the production and commercial applications of all currently available industrial gases. A line of systems for either gaseous or liquid delivery and storage is outlined. (Air Reduction Co., Inc.)

For free copy circle No. 20 on postcard

Lightweight Structurals

Ideas that promote fast, economical building construction through the use of lightweight steel structurals are highlighted in a 16-page booklet. Specifications for a line of such components are included. (Jones & Laughlin Steel Corp.)

For free copy circle No. 21 on postcard

Plant Description

A new plant and facilities at Coshocton, Ohio, for cold finishing of stainless-steel strip are covered in an eight-page color brochure. This plant supplements facilities at Bridgeville, Pa. (Universal-Cyclops Steel Corp.)

For free copy circle No. 22 on postcard

Immersion Heater Guide

A two-page bulletin is a guide to selection from a line of immersion heaters for water, alkaline, or plating-bath heating. Choice of thermostats and temperature controls is covered, and a wiring diagram for thermostat and magnetic switch controls is included. (General Electric Co.)

For free copy circle No. 23 on postcard

Swivel-Plate Casters

A line of medium-duty swivel-plate casters is illustrated and described in a bulletin. They have double ball bearings and are designed for equipment carrying loads up to 2000 lb. They come in sizes

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FREE LITERATURE

of 5, 6, and 8 in., in a variety of treads. (Faultless Caster Corp.)

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2000-lb Fork Truck

A 2000-lb-capacity electric-powered forklift truck is illustrated and described in a four-page bulletin. (The Elwell-Parker Electric Co.)

For free copy circle No. 25 on postcard

Eyelets, Machines

A complete line of eyelets and eyeleting machines is illustrated and described in a 48-page catalog. Full specifications are given. (United Shoe Machinery Corp.)

For free copy circle No. 26 on postcard

Dry Bushings

A supplement has been issued to a bulletin on dry bushings and thrust washers made of a dry-bearing material. It includes new information on these components and dimensions, alternate installation tolerances, and instructions for fitting both. (The United States Gasket Co.)

For free copy circle No. 27 on postcard

Sheet-Metal Tools

A 48-page catalog illustrates machines and hand tools for cutting and shearing sheet metal, and other fabricating operations, such as forming, grooving, crimping, and slitting. (The Peck, Stow & Wilcox Co.)

For free copy circle No. 28 on postcard

Pressure Sensors

Two models of in-line-mounted flow-rate transmitters, for low-flow metering of either liquids or gases, are described in a brochure. They are actuated by differential pressure. (Fischer & Porter Co.)

For free copy circle No. 29 on postcard

Control Board

Benefits accruing from use of a peg-and-tape production control board are illustrated in a colorful brochure demonstrating its use at Redstone Arsenal. (Wassell Organization, Inc.)

For free copy circle No. 30 on postcard

Brass Nuts

Engineering specifications on a complete line of all types of precision brass nuts are presented in a brochure. (Cornell Mfg. Co., Inc.)

For free copy circle No. 31 on postcard

Nuclear Instruments

A 50-page catalog presents a series of nuclear instruments for use in all phases of nuclear study, including detectors, counting and radiation-analysis equipment, sample changing equipment, and all the necessary adjuncts for personnel protection, monitoring, and handling. Some of this equipment could be of use to industrial users of isotopes, also. (Tracerlab, Inc.)

For free copy circle No. 32 on postcard

Inert Gas Generators

A line of packaged inert atmosphere generators for various industrial uses is described in a bulletin. (Gas Atmospheres, Inc.)

For free copy circle No. 33 on postcard

Protective Coatings

A brochure covers the applications and economics of spray-on, strip-off protective coating. It can also be used as a masking compound for painting and for various treating operations. (Spraylat Corp.)

For free copy circle No. 34 on postcard

Printed-Circuit Drill

A new automatic circuit drilling machine operates from a master template to drill printed circuit boards of the most complex patterns at the rate of 60 or more per minute. A woodpeckering action is available for drilling through stacks of boards. An automatic clamping device is integrated with the drill cycle. Length of stroke is 2 in., and drill capacity is #60 through 3/8 in. (The Dumore Co.)

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How **DENISON MULTIPRESS** cuts costs of **FORMING**

DENISON MULTIPRESS flares and sizes 16,000 pen tips a day for SCRIPTO

57 parts-a-minute—16,000 a day—that's the production turned out on the two-ton Denison Multipress at Scripto, Inc., Atlanta, Georgia.

The job—to flare and size the inside and outside of ballpoint pen tips.

How it's done—parts are loaded on automatic indexing table mandrels. As the mandrel indexes beneath the ram, the ram decends, hydraulically, to a preset pressure to form the metal over a form. Regardless of part-size variation, the ram will not return until the preset pressure is reached.

Simplifies semi-automatic operation *at Scripto, Inc. Denison two-ton Model "A" Multipress uses 8-station, dial feed table to hold parts at cycle time of 57-per-minute.*

Production tooling *for flaring and sizing of ballpoint pen tips. Controlled, hydraulic ram pressure keeps size uniform throughout the day.*

Finished parts are ejected by air at the unloading station, so the operator has only to load parts.

The result—quality is duplicated on every part, so scrap is nil.

High-speed, quality production like this can be duplicated in your plant—and with savings, too. Call your Denison representative in to show you how!

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DENISON HydrOILics

FORGING QUALITY HOT ROLLED BARS

Reduction of the steel billet to desired bar size is performed in a multi-pass operation, carefully programmed to achieve optimum bar quality. Instrumented furnaces at the J&L Pittsburgh Works bar mill provide accurate control of steel billet temperature.

Hot flame scarfer removes surface imperfections from the bloom to assure top quality steel billets, basic raw material for the bar mill.

3" x 3" steel billets emerge from the billet mill to this cooling bed where they are tested by J&L metallurgists for product uniformity.

Forging quality hot rolled bars leave the bar mill on this runout table. They are inspected for accuracy of section.

Refrigerator cam shaft, forged from a 57/64" coarse grained C-1117 square, has a perfect balance of properties for long, hard usage.

Automobile transmission part, forged from a 2¼" round, has exact balance of properties that helps reduce production cost. AISI Grade 4027.

Automobile steering knuckle support is forged from 1-15/16" J&L round. AISI Grade 1340.

J&L Forging Quality Hot Rolled Bars are carefully detailed for precise balance of chemistry and physical properties to meet your special requirements. As an integrated producer, J&L combines control of raw materials with the special facilities and successful production experience that are necessary **to provide exactly the right forging quality steel for any application.** A field staff of J&L metallurgical consultants will work with you to determine the steel which will best serve your particular requirements for forging, machining and end product use. The consultant then works directly with the J&L mill to obtain a forging steel that **is tailor-made for your operation.** Simply call your local J&L district office for a preliminary discussion, or you may write directly to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

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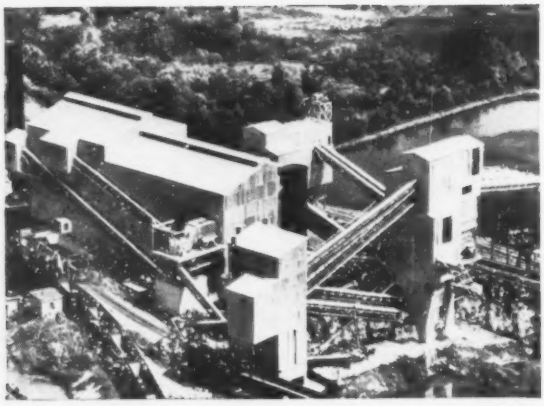

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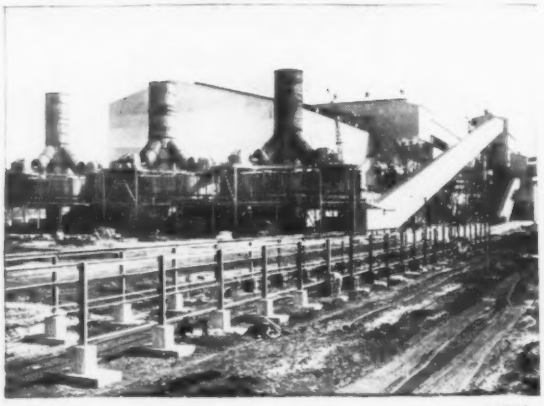

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and now:

THE WORLD'S LARGEST SINTER MACHINE

Sinter machine width: 13′ 2″

Sinter machine length: 184′

Sinter machine area: 2419 sq. ft.

Engineering constructor—Dravo Corporation

For: Jones & Laughlin Steel Corporation, at Aliquippa, Pennsylvania

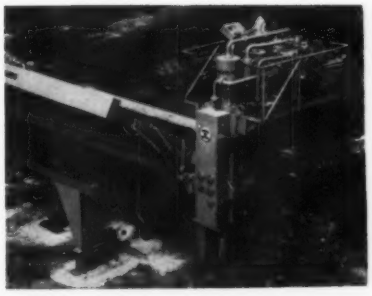
DRAVO
CORPORATION
PITTSBURGH 22, PA.

New Equipment and Machinery

Hydraulic Scrap Shear Replaces Cutting Torch

A 600-ton hydraulic scrap shear, with a compression-type charging chamber to facilitate loading, handles a wide variety of materials, including the heavy and difficult work usually prepared with cutting torches. Railroad-car siding, bolsters, heavy structural and bar scrap, including heavy rail, are all grist for the mill. Shearing capacity is 5½-in. round or 1¼-in. mild steel plate, 5 ft wide, and output will exceed 100 tons per day at 4 to 6 cuts per minute. (Harris Foundry & Machine Co.)

For more data circle No. 36 on postcard, p. 91



Close Temperature Control for Heat-Treating

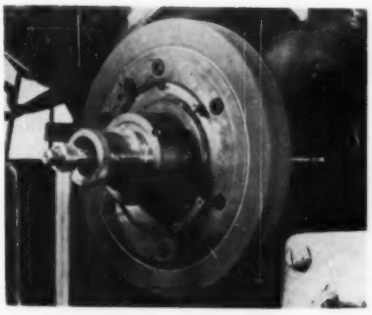
A general-purpose furnace provides close temperature control for a wide range of industrial heat-treating applications. It can reach any temperature to 1250°F maximum, up or down, in minutes, and maintains temperature uniformity with ±5°F during treatment. Proportional heat control handles power, and a time proportioning controller protects against over-temperature. Easy to operate, it comes with different depths and different work-basket sizes. (C. I. Hayes. Inc.)

For more data circle No. 37 on postcard, p. 91

Balances Grinding Wheels Without Removal

A portable precision balancer offers fast, accurate balancing of wheels without removal from the grinder, making possible great savings in grinding operations by reducing rejects from bad wheels and cutting downtime. It is designed to do the job in less than 30 minutes. Once the hub and wheel are in position, a set of three adjustable weights inserted in the hub are used to balance the wheel. Two balance screws on each weight permit infinite micrometer adjustment of the weight, and high accuracy is obtained. (Aero Supply Mfg. Co. Inc.)

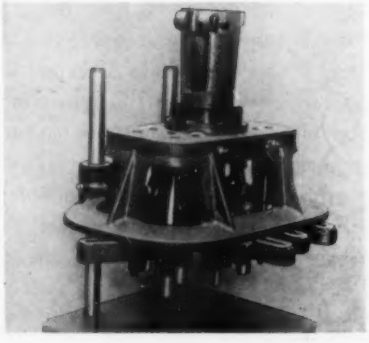
For more data circle No. 38 on postcard, p. 91



Head Operates With From 2 to 11 Spindles

Another model in a line of universal-ball-joint adjustable-spindle drilling and tapping heads, this can be operated with from 2 to 11 spindles, to convert any single-spindle drill press into a high-production multi-hole operation. It will either drill or tap, using interchangeable face plates. It has a capacity up to 5/16 in. in steel and, through the flexibility of the universal joints, can be set to any hole pattern within a working area of 6 x 12 in. It features one-shot lubrication and a capacity for top speed in either direction without vibration, regardless of spindle arrangement. (Ettco Tool & Machine Co., Inc.)

For more data circle No. 39 on postcard, p. 91



Now the nation's third largest steel plate producer

The men who guide Lukens purchasing activities are, left to right, Edmund Pfeifer, Director of Purchases; E. Clair Book, Purchasing Consultant; and Albert W. Gudal, Purchasing Agent.

LUKENS SALUTES ITS PURCHASING MEN

. . . for their important contribution to the company's growth. Purchasing is one of modern management's most valued skills. Lukens knows this well, for it has aided our progress consistently in recent years—especially during our "Phase A" expansion program which raised us to third position among steel plate producers. Lukens' experienced purchasing team worked closely with contractors to achieve on-time completion of this project, and is now geared to more critical procurement demands than ever.

Our customers can now look forward to a growing supply of carbon and alloy steel plate, plate shapes, heads, weldments . . . Lukens "T-1," "Nine Nickel" and clad steels. In addition to greater capacity, the new facilities will provide even better steel plate quality.

Careful, competent purchasing was essential to the realization of "Phase A" objectives: *new capacity and quality levels to meet the growing demands of our plate fabricating customers.* Lukens Steel Company, Coatesville, Pa.

NEW CAPACITY ~ NEW QUALITY

LUKENS

SERVING INDUSTRY WITH A WIDE RANGE OF SPECIALTY CARBON, ALLOY, ARMOR AND CLAD STEEL PLATE • HEADS • PLATE SHAPES • PLATE-MATE WELDING ELECTRODES AND WIRE

The Iron Age Summary

Steel Users Built Big Stocks

It's estimated that steel inventories are at 23-24 million tons —100 days over-all.

But stocks are not in balance and not evenly distributed. So effect will be felt fairly soon.

▪ Steel users did a better job of building inventories than earlier predictions had indicated. A recent check shows that users went into the strike with inventories of 23 to 24 million tons—two to three million tons higher than estimates of several months ago. Metalworking plants added close to 10 million tons to stocks in the first half.

But this huge over-all inventory does not mean that steel users could weather a 100-day strike. Far from it. These inventories are not in balance, and they are not evenly distributed. Some users have more than 100 days' over-all supply, others less. But few, if any, have perfect balance in terms of products, grades, gages, and sizes.

Strike's Impact—As a result, a few steel users would begin to feel the pinch in less than a month. And the impact would grow with each succeeding week. After six weeks, the effect on the economy would verge on the serious.

Another cause for worry: If the strike lasts any length of time—and there is a good chance that it will —many plants will need every bit of cushion they have. The customer who is not already on order books will have to wait as long as two months after the startup for flat-rolled products — sheet and strip.

Bright Spot—One bright spot in the picture is the fact that mills representing more than 15 pct of the industry's capacity will continue to operate during all or part of the strike period (see page 100). There are more than 70 such plants—mills whose contracts have not yet expired, or who have been granted an extension, or who are not under contract with the United Steelworkers. These mills account for about 23 million of the industry's 147.6 million-ton annual capacity.

Many steel users also are turning to steel service centers (warehouses) for help. The service centers went into the strike with record inventory of 3.7 million tons, according to the American Steel Warehouse Assn. However, some of these warehouses, those affiliated with struck mills and represented by the steel union, have also been struck.

Settlement Outlook — As for prospects for settlement, it looks like a long strike barring positive action by President Eisenhower (see page 102). The Administration would like to avoid any knocking of heads unless the strike lasts long enough to imperil the national welfare. Should that happen, it can invoke the emergency provisions of the Taft-Hartley Act to get the men back to work during an 80-day "cooling off" period while a fact-finding board studies the issues.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 382	Last Week 1,089	Month Ago 2,491	Year Ago 1,546
Ingot Index (1947-1949=100)	23.8	67.8	155.1	96.2
Operating Rates				
Chicago	5.0	36.0*	93.0	64.0
Pittsburgh	4.0	22.0*	82.0	49.0
Philadelphia	15.0	41.0*	90.0	65.0
Valley	10.0	30.0*	82.0	47.0
West	0.0	32.0*	93.0	63.0
Cleveland	0.0	24.0*	91.0	50.0
Detroit	24.0	33.0*	95.0	59.0
Buffalo	00.0	105.0	105.0	39.0
South Ohio River	77.0	83.0*	91.0	38.0
South	11.0	81.5	92.0	75.0
Upper Ohio River	52.0	63.0*	88.0	90.0
St. Louis	82.0	90.0*	89.0	36.0
Aggregate	13.5	38.5	88.0	57.3

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	$66.41	$66.41	$66.41	$66.49
Scrap No. 1 hvy (Gross ton)	$39.50	$39.17	$38.17	$38.17
No. 2 bundles	$27.00	$27.00	$25.50	$27.17
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.10
Copper, electrolytic	30.00	30.00*	31.50	26.50
Lead, St. Louis	11.80	11.80	11.80	10.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.00	102.25	103.50	95.125
Zinc, E. St. Louis	11.00	11.00	11.00	10.00

Where Mills Are Still Producing

Here are the mills still in production despite the national steel strike.

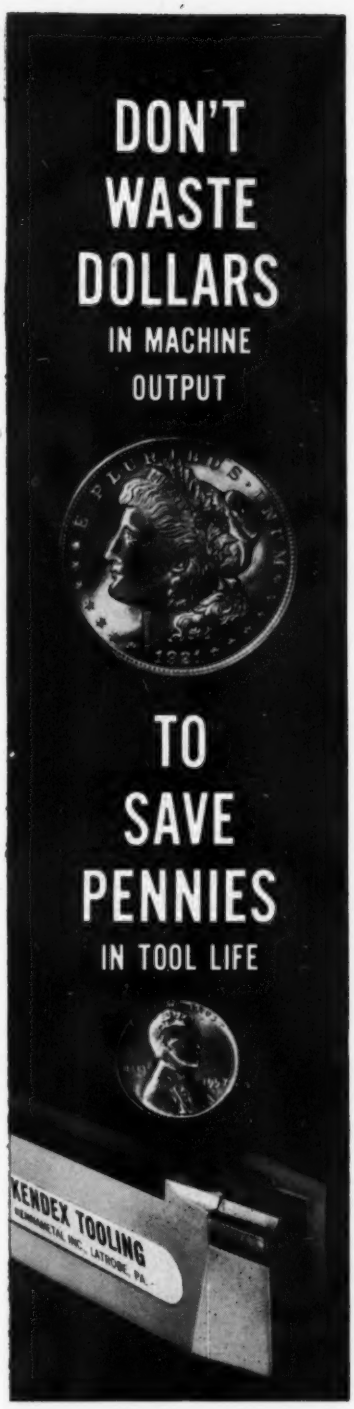
■ Some 70 steel plants representing more than 15 pct of the industry capacity are still operating despite the strike called by the United Steelworkers. These plants produce about 23 million ingot tons a year.

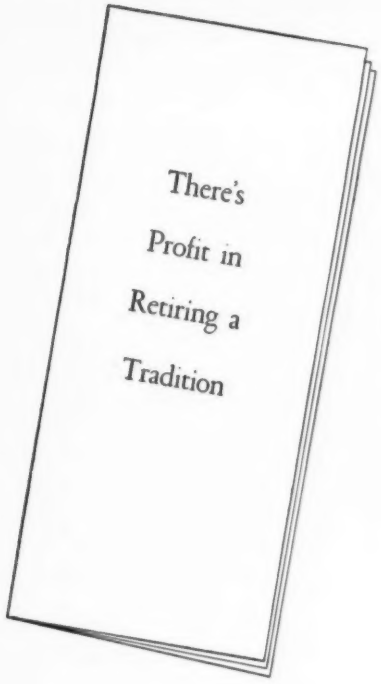
These mills have escaped the strike, in some cases perhaps only temporarily, for either of three reasons: (1) Contracts have not yet expired, (2) contracts have been extended, or (3) the plants are not under contract with the USW.

Here is The IRON AGE compilation of these companies, by location, capacity, and contract status:

Company	Location	Ingot Capacity (tons)	Contract Expiration
ALABAMA			
Kilby Steel Co.	Anniston	34,020	*
Porter, H. K., Co., Inc.			
Connors Steel Div.	Birmingham	115,000	9/1/59
Southern Electric Steel Co.	Birmingham	66,000	8/31/59
ARIZONA			
Yuba Consolidated Industries, Inc.			
Western Rolling Mills Div.	Helena	60,000	*
CALIFORNIA			
Armco Steel Corp.	Torrance	50,000	*
Southwest Steel Rolling Mills, Inc.	Los Angeles	45,000	8/1/59
CONNECTICUT			
Carpenter Steel Co.			
Carpenter Steel of New England, Inc.	Bridgeport	84,000	7/31/59
FLORIDA			
Florida Steel Corp.	Tampa	43,000	*
ILLINOIS			
Columbia Tool Steel Co.	Chicago Hgts.	6,600	*
Finkl, A., & Sons Co.	Chicago	33,600	*
Granite City Steel Co.	Granite City	1,440,000	E
International Harvester Co.			
Wisconsin Steel Works	S. Chicago	1,200,000	*
Keystone Steel and Wire Co.	Peoria	475,000	*
Laclede Steel Co.	Alton	600,000	8/31/59
INDIANA			
Borg-Warner Corp.			
Ingersoll Steel Div.	New Castle	84,000	*
Continental Steel Corp.	Kokomo	420,000	7,31/59
Joslyn Mfg. & Supply Co.	Ft. Wayne	37,500	7/31/59
KENTUCKY			
Jessop Steel Co.			
Green River Steel Corp.	Owensboro	183,190	E
MICHIGAN			
Allegheny Ludlum Steel Corp.	Ferndale	3,000	*
Ford Motor Co.	Dearborn	1,898,600	*
MISSISSIPPI			
Mississippi Steel Corp.	Flowood	45,000	*
NEW YORK			
Simonds Saw & Steel Co.	Lockport	21,600	8/31/59
Wickwire Bros., Inc.	Cortland	32,440	7/31/59
OHIO			
American Compressed Steel Corp.	Cincinnati	21,600	*
Armco Steel Corp.	Middletown	2,557,000	*
Copperweld Steel Co.	Warren	660,000	E
Detroit Steel Corp.	Portsmouth	1,500,000	E
Gilmore Steel & Supply Co., Inc.			
(Oregon Steel Mills)	Portland	150,000	7/31/59
Republic Industrial Corp.			
Industrial Forge & Steel, Inc.	Canton	84,000	8/31/59
Timken Roller Bearing Co.	Canton	700,000	8/24/59
Universal-Cyclops Steel Corp.			
Empire-Reeves Steel Corp.	Mansfield	500,000	8/31/59
PENNSYLVANIA			
Alco Products, Inc.	Latrobe	108,650	**
Armco Steel Corp.	Butler	557,000	*
Babcock & Wilcox Co.	Beaver Falls	229,450	E
Baldwin-Lima-Hamilton Corp.			
Standard Steel Works Div.	Burnham	188,710	8/31/59
Carpenter Steel Co.	Reading	87,500	*
Edgewater Steel Co.	Oakmont	117,600	8/31/59
Erie Forge & Steel Corp.	Erie	284,000	8/31/59
Firth Sterling Steel Corp.	McKeesport	20,040	E
General Tire & Rubber Co.			
Byers, A. M., Co.	Ambridge	90,000	7/31/59
Harsco Corp.			
Harrisburg Steel Co. Div.	Harrisburg	100,750	11/15/59
Heppenstall Co.	Pittsburgh	55,550	7/31/59
Heppenstall Co.			
Midvale-Heppenstall Co.	Philadelphia	157,700	*
Jessop Steel Co.	Washington	35,800	E
Latrobe Steel Co.	Latrobe	24,000	8/14/59
Lukens Steel Co.	Coatesville	930,000	7/31/59
Merritt-Chapman & Scott Corp.			
Milton Steel Div.	Milton	90,000	11/30/59
Mesta Machine Co.	New Castle	66,000	*
Mesta Machine Co.	W. Homestead	105,000	*
National Forge & Ordnance Co.	Irvine	25,000	*
Poncoyd Steel & Forge Corp.	Philadelphia	15,600	6/19/60
Phoenix Steel Tube and Struct. Div.	Phoenixville	360,000	**
Phoenix Steel Plate Div.	Harrisburg	496,760	**
Union Electric Steel Corp.	Carnegie	25,000	7/31/59
Vanadium-Alloys Steel Co.	Latrobe	12,000	*
Vanadium-Alloys Steel Co.			
Colonial Steel Co. Div.	Monaca	30,000	7/31/59
Vulcan-Kidd Steel Div.	Aliquippa	9,600	8/15/59
Wood, Alan, Steel Co.	Ivy Rock	800,000	7/31/59
RHODE ISLAND			
Washburn Wire Co.	Phillipsdale	93,000	10/15/59
TENNESSEE			
Knoxville Iron Co.	Knoxville	38,000	*
TEXAS			
Godfrey L. Cabot, Inc.			
Cabot Shops, Inc.	Pampa	16,200	*
Cameron Iron Works, Inc.	Houston	58,800	*
LeTourneau, R. G., Inc.	Longview	90,000	*
Lone Star Steel Co.	Lone Star (Daingerfield)	800,000	9/7/59
Texas Steel Co.	Ft. Worth	132,450	*
VIRGINIA			
Newport News Shipbuilding & Dry Dock Co.	Newport News	15,000	*
Roanoke Electric Steel Corp.	Roanoke	25,000	*
WASHINGTON			
Isaacson Iron Works, Inc.	Seattle	102,000	*
Northwest Steel Rolling Mills, Inc.	Seattle	53,000	7/31/59
WEST VIRGINIA			
National Steel Corp.			
Weirton Steel Div.	Weirton	3,330,000	*
Porter, H. K. Co., Inc.	Huntington	110,000	4/30/60

E = Contract extended.
* = Not organized by USWA.
** = 30 days after U. S. Steel Agreement.





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Typical Examples — Same Machines . . . Same Tools . . . Same Workpieces

	Job No. 1		Job No. 2		Job No. 3		Job No. 4	
	240-Minute Tool Life Setup	25-Minute Tool Life Setup	75-Minute Tool Life Setup	25-Minute Tool Life Setup	120-Minute Tool Life Setup	80-Minute Tool Life Setup	120-Minute Tool Life Setup	22-Minute Tool Life Setup
Machine Cost per Hour	$ 8.00	$ 8.00	$10.00	$10.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00
Tool Cost per Hour	$ .04	$ .40	$ .36	$ .76	$ .14	$ .215	$ .14	$ .77
Cost per 8-Hour Shift	$64.32	$67.20	$82.88	$86.08	$73.12	$73.72	$73.12	$78.16
Pieces per Shift	51	181	8	17	94 hrs./pc.	41 hrs./pc.	8	16
Cost per Piece	**$ 1.26**	**$ .37**	**$10.36**	**$ 5.06**	**$859.16**	**$377.81**	**$ 9.14**	**$ 4.88**
Cost Reduction	70%		51%		56%		47%	

How Long Will the Strike Last?

The steel walkout is shaping up to be long and bitter barring political pressure.

But the Administration is expected to keep hands off unless real emergency arises.

■ This is shaping up to be a long and bitter steel strike unless political pressure is brought to bear to effect a quick settlement. And that isn't considered likely.

President Eisenhower and his Administration are worried about the effect of the strike on (1) the general economy, (2) the Federal budget (that is tax losses), (3) international prestige, and (4) national defense.

Ike's Position—At the same time, the Administration wants to avoid any knocking of heads unless the strike lasts long enough to imperil the national welfare. Should that happen, the Government can invoke the emergency provisions of the Taft-Hartley Act to get the men back to work during an 80-day "cooling off" period while a fact-finding board studies the issues.

The issues are basic, and involve the Administration as well as the mills and the United Steelworkers. President Eisenhower has made it clear he wants a non-inflationary settlement—that is, one that will not require a steel price increase.

How Mills Feel—The mills are just as strong as the President on this question of inflation. They have offered to extend the old contract without change for one year. Either that, or they will talk about modest fringe and wage concessions under a two-year agreement if the union will agree to changes in local working practices to give management freedom to run its plants more efficiently.

These are what make the issues involved so fundamental and thus diminish the chances for an early settlement. The big question of management rights is involved. So is inflation and the power of the union to wring concessions every time it comes to bat. The threat of foreign steel competition is part of the picture but it's being overshadowed by the other issues.

Union on the Spot—Whether it's true or not, the union is acting as though it were fighting for its life. The issue of local working practices is a real grass-roots matter (See page 29). It touches the working day and conditions of every worker in the mills and thus every member of the union. If the union loses on this one, says USW leaders, it could shake the organization to its very foundations. Not to mention the political implications for the union hierarchy.

The union leadership feels just as adamant on the question of contract improvements. It believes it is entitled to a 15-cent-an-hour package covering fringe and wage concessions. It justifies this on the basis of the profit position of the steel companies. It is just incidental that the 15 cents is about the average gain of union members in each of the three years of the old contract.

A Blind Alley—For the moment, at least, everybody seems to be up a blind alley. It's hard to see how the situation can be worked out in such a way that each of the three parties to the dispute—management, labor, and government—can save face. A lot more than steel prices hangs in the balance.

The situation seems to be made to order for the politicians. You can look for the Democrats to move into the battle in the hope of embarrassing the Republican Administration. It's questionable whether this will contribute anything worth while toward a settlement.

Courting the Public—Meanwhile, both management and labor will continue their campaigns to justify their position with the public.

The companies will be particularly hard put to get across an explanation of the local working practices issue. This is a technical area in labor relations involving incentives, seniority, crew assignments, and so on.

NO SETTLEMENT: R. Conrad Cooper, steel industry chief negotiator, strides from press conference after contract talks with steelworkers union broke down.

Other Strike News

The Issues Run Deep—Issues in the strike are basic: Management rights, inflation, wages. P. 29

Who's Still Operating — A rundown of mills still operating despite the walkout. P. 100.

COMPARISON OF PRICES

(Effective July 21, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type:** declines appear in *Italics.*

	July 21 1959	July 14 1959	June 23 1959	July 22 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloys blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

	July 21 1959	July 14 1959	June 23 1959	July 22 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.97
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.47
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.49
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.50	$43.50	$42.50	$40.50
No. 1 steel, Phila. area	39.50	39.50	37.50	34.50
No. 1 steel, Chicago	35.50	34.50	34.50	39.50
No. 1 bundles, Detroit	37.50	37.50	35.50	31.50
Low phos., Youngstown	44.50	44.50	42.50	41.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	50.50	48.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	48.50
No. 1 mach'y cast, Chicago	59.50	59.50	58.50	48.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$39.50	$39.17	$38.17	$38.17
No. 2 bundles	27.00	27.00	25.50	27.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50-15.50	$14.50-15.50	$14.50-15.50	$15.38
Foundry coke, prompt	18.50	18.50	18.50	17.50-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	30.00	30.00*	31.50	26.50
Copper, Lake, Conn.	30.00	30.00*	31.50	26.50
Tin, Straits, N. Y.	102.00†	102.25*	103.50	95.125
Zinc, East St. Louis	11.00	11.00	11.00	10.00
Lead, St. Louis	11.80	11.80	11.80	10.80
Aluminum, virgin ingot	26.80	26.80	26.80	26.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Post-Strike Outlook Keeps Prices Firm

Dealers anticipate heavy mill demand for scrap once the strike is over.

The market is strong even though there is little activity now.

■ The first full week of the steel strike finds scrap prices strong and dealer optimism running high. But the degree of optimism varies from one district to another.

In the volatile Chicago market, it is higher than anywhere else. To dealers there, the strike is a rainbow and at the end of it is a potful of orders that will keep them busy well into the fourth quarter. Out-of-district sales and some laying down of material has given rise to speculative buying. In spite of the steel strike, prices of most openhearth grades rose $1 there this week.

In Philadelphia, as in most other port districts, a steady flow of export orders is draining good scrap, indicating that prices will remain at least steady for the next month or more. When the strike is settled and the mills again begin buying, there will be no surplus of scrap in these districts.

At Pittsburgh, optimism is somewhat tempered but dealers there appear determined to hold the price line for the duration of the strike. The situation is similar in Cleveland and Detroit.

Based on the $1 increase in Chicago, The IRON AGE No. 1 heavy melting Composite Price rose 33¢ to $39.50.

Pittsburgh—The market here is closed. In the early days of the shutdown, strikebound mills showed little interest in laying down material or in placing orders for delivery after the startup. Dealers are taking in scrap but not eagerly. Feeling is that dealers will hold the price line during the strike in anticipation of heavy demand and strong prices after the settlement.

Chicago — A small but steady movement of scrap continues. Speculative buying, purchases by out-of-area mills, and some laying down of scrap combined to force prices of openhearth scrap up $1. Dealers continue to sit tight on yard stocks and show little inclination to sell. Prices give every indication of repeating the slow rise of past strike periods as dealers and scrap producers continue to hold out for stronger prices.

Philadelphia — Export is the major activity here. Even though a three-week dock strike is as yet unsettled, brokers are accepting delivery at the piers. The moment the strike is over, three ships will start loading. In the domestic market, cupola cast was sold at quoted prices. Scrap is becoming scarcer. Prices are unchanged but strong.

New York — Openhearth scrap prices moved up $2 on the basis of strong export orders. Domestic shipments have slowed almost to a halt. Turnings prices are weakening, but cast grades are holding up well.

Detroit—Volume of scrap moving into yards is low. Little distress scrap is available so dealers are reluctant to sell below current prices. Tone of the market will be definitely established when the trade commits itself for the next month's industrial lists.

Cleveland — Shipment of scrap into district mills stopped with the strike. Industrial and railroad scrap for one mill is being diverted into yards. In the Valley, mills continue to take scrap at prices unchanged from earlier in the month. There are no price changes.

St. Louis—A feeling of uncertainty exists in the market despite the fact that two mills are operating temporarily. Most railroad items are up $1 and cupola cast is up $2. Higher prices, it is feared, might attract scrap from the Chicago district.

Birmingham — Despite the steel strike, scrap prices are strong. An Atlanta mill, granted an extra two-weeks extension, bought No. 2 heavy melting at $4 above its last price. An electric furnace mill bought at current prices. Dealers seem willing to sell at present levels. The cast market is firm.

Cincinnati — Prices are holding firm as shipments continue on a reduced basis. Brokers are reported covered on old orders. New business is not expected for a week or more. Dealers are in a firm position to ride out the strike period.

Buffalo — There have been no sales in the past week and prices are unchanged. Mills are not taking shipment. Dealers have settled down to wait out the strike.

Boston—Prices of primary openhearth grades are up $1 on the strength of export buying. Mixed cupola cast is up $1.

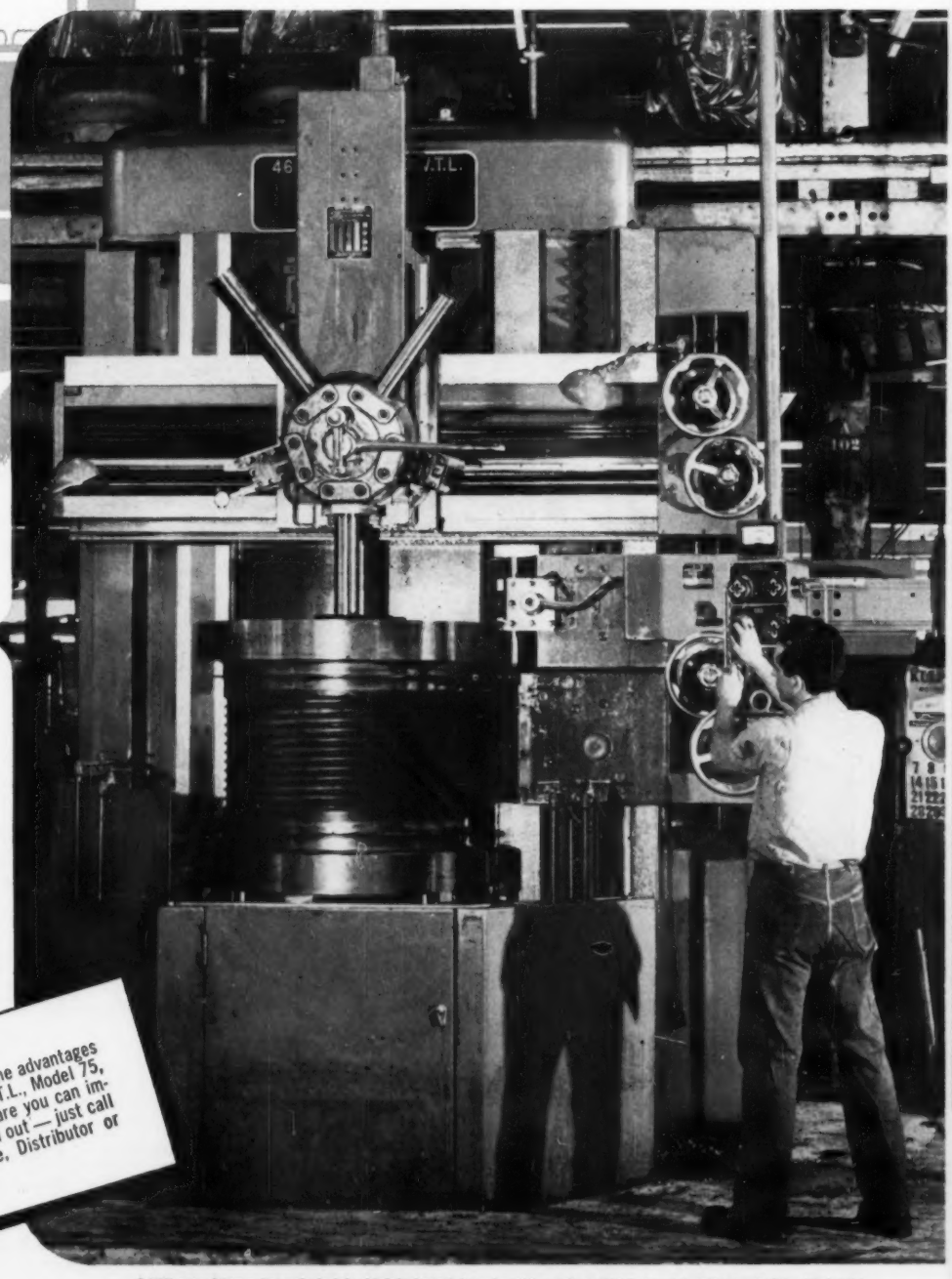
West Coast — Prices are unchanged. The only scrap moving is for export. It's still too early to tell the effect the steel strike will have on the market.

Houston — Prices are holding steady on mill grades. Export is fairly active. A nominal amount of scrap is moving to foundries.

It Pays To Replace

An analysis of cost records at Philadelphia Gear Corporation, Philadelphia, Pa., shows, according to Mr. John Walker, Shop Foreman,

"A savings of up to 30% in overall production over our older 42" Bullard V.T.L. with our 46" Cut Master V.T.L., Model 75."



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THE BULLARD COMPANY BRIDGEPORT 9, CONN.

SCRAP PRICES *(Effective July 21, 1959)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs plate	47.00 to 48.00
Heavy turnings	35.00 to 36.00
No. 1 RR hvy. melting	44.00 to 45.00
Scrap rails, random lgth.	52.00 to 53.00
Rails 2 ft and under	57.00 to 58.00
RR specialties	52.00 to 53.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	43.00 to 44.00
Stainless	
18-8 bundles and solids	230.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	40.00 to 41.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge corps	50.00 to 51.00
Low phos. punch'gs plate, ¼ in. and heavier	47.00 to 48.00
Low phos. 2 ft and under	45.00 to 46.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	50.00 to 51.00
Rerolling rails	60.00 to 61.00
Rails 2 ft and under	55.00 to 56.00
Angles and splice bars	51.00 to 52.00
RR steel car axles	65.00 to 66.00
RR couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	59.00 to 60.00
Cupola cast.	52.00 to 53.00
Cast iron wheels	44.00 to 45.00
Malleable	60.00 to 61.00
Stove plate	50.00 to 51.00
Steel car wheels	49.00 to 50.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	115.00 to 120.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	34.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	26.00 to 28.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	19.00 to 20.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	23.00 to 24.00
Clean cast. chem. borings	27.00 to 28.00
Low phos. 5 ft and under	41.00 to 42.00
Low phos. 2 ft punch'gs	43.00 to 44.00
Elec. furnace bundles	41.00 to 42.00
Heavy turnings	33.00 to 34.00
RR specialties	44.00 to 45.00
Rails 18 in. and under	59.00 to 60.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	42.00 to 45.00
Cast iron car wheels	45.00 to 46.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.50 to $36.50
No. 2 hvy. melting	30.50 to 31.50
No. 1 dealer bundles	35.50 to 36.50
No. 2 bundles	25.00 to 26.00
Machine shop turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.00 to 21.00
Low phos. 18 in. and under	44.00 to 45.00
Rails, random length	47.00 to 48.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	42.00 to 43.00
Drop broken cast.	52.00 to 53.00

Youngstown

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	29.50 to 30.50
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	28.50 to 29.50
Machine shop turn.	18.50 to 19.50
Shoveling turnings	23.50 to 24.50
Low phos. plate	44.00 to 45.00

Cleveland

No. 1 hvy. melting	$39.50 to $40.50
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	39.50 to 40.50
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	39.50 to 40.50
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Cut structural & plates, 2 ft & under	45.00 to 46.00
Drop forge flashings	39.50 to 40.50
Low phos. punch'gs plate	40.50 to 41.50
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails 2 ft and under	57.00 to 58.00
Rails 18 in. and under	58.00 to 59.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	56.00 to 57.00
No. 1 machinery cast.	54.00 to 55.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 busheling	33.00 to 34.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00 to 18.00
Low phos. plate	40.00 to 41.00
Structurals and plate, 2 ft and under	41.00 to 42.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	19.00 to 20.00
No. 1 RR hvy. melting	40.00 to 41.00
Rails, random lengths	46.00 to 47.00
Rails, 18 in. and under	51.00 to 52.00
Angles and splice bars	45.00 to 46.00
RR specialties	46.00 to 47.00
Cupola cast.	52.00 to 53.00
Heavy breakable cast.	40.00 to 41.00
Cast iron brake shoes	40.00 to 41.00
Stove plate	45.00 to 46.00
Cast iron car wheels	40.00 to 41.00
Rerolling rails	57.00 to 58.00
Unstripped motor blocks	41.00 to 42.00

Birmingham

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 special bundles	38.00 to 39.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar corps and plate	45.00 to 46.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	46.00 to 47.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	45.00 to 46.00
Rerolling rails	56.00 to 57.00
No. 1 cupola cast.	55.00 to 56.00
Stove plate	55.00 to 56.00
Cast iron car wheels	43.00 to 44.00
Unstripped motor blocks	42.00 to 43.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 dealer bundles	20.00 to 21.00
Machine shop turnings	9.00 to 10.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 prepared solids	195.00 to 200.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	35.00 to 36.00
Drop forge flashings	34.00 to 35.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	36.00 to 37.00
Mixed cupola cast.	43.00 to 44.00
Automotive cast.	53.00 to 54.00
Stainless	
18-8 bundles and solids	195.00 to 205.00
18-8 turnings	85.00 to 95.00
430 bundles and solids	85.00 to 95.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	16.00 to 17.00
No. 1 machinery cast.	35.00 to 36.00
Mixed cupola cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	33.00
No. 1 dealer bundles	33.00
No. 2 bundles	22.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	$38.00 to $40.00
No. 2 hvy. melting	36.00 to 38.00
No. 1 dealer bundles	35.00
No. 2 bundles	18.00 to 20.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under (foundry)	49.00
No. 1 cupola cast.	45.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Bush., new fact., prep'd.	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$45.00 to 46.00
Unstripped motor blocks	38.50 to 39.50
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	28.00 to 29.00

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Aluminum Contract Extension Likely

Outlook is for at least two weeks of labor peace after aluminum producers' union contracts expire July 31.

Aluminum is not likely to settle before steel, but it could happen.

■ The steel strike raises the question of whether aluminum plants, too, will be struck.

The Big Three U. S. producers' contracts with their biggest unions —United Steelworkers of America and Aluminum Workers International—expire July 31. Usually steel sets the pattern for the aluminum contract.

Likely to Keep Working — The situation is still too smoky for a solid prediction. Most of the trade figure the unions will tear a page from the steel book and extend contracts at least once—from two weeks to a month.

Beyond that, it's strictly a shot-in-the-dark, and no one is sticking his neck out.

Steel Still Key—A spokesman for a producer believes stabilization of the steel situation may be the key. He says if the issues in steel remain clear cut, and there is at least the promise of some positive action, aluminum unions will keep working.

Another notes that David J. McDonald, United Steelworkers chief, has usually coordinated aluminum action with his position in steel. For instance, in 1956 USW aluminum workers struck to emphasize steel workers' higher pay demands, despite the fact that AWI kept almost half the industry's capacity going.

Aluminum First?—The odds on aluminum settling before steel are still pretty long, but there are elements in the picture that could shorten them.

Originally it was suggested that aluminum wouldn't settle first because the union would prefer to stick to the pattern of letting steel set the pace.

Now, they say the union's position is clearly weaker than it has been in some years, that Mr. McDonald might be eager to get a small aluminum settlement as a lever against steel management if it looked as if he might suffer a bad defeat in the steel strike. But aluminum management, while clearly not in favor of a strike that might up-end what looks like its biggest year, isn't going to give more than it has to.

Observers say aluminum will avoid getting down to basic economic issues just as long as it can. It wants to take advantage of steel management's strong stand.

Issues Differ—It's generally agreed that were it not for the traditional relationship of steel and aluminum, the chances for an aluminum settlement without major conflict would be better.

There's a difference on a key issue that may promote easier meeting of the minds in aluminum.

Steel management's firmest point has been on its right to get rid of featherbedding and antiquated work practices.

Aluminum is a younger industry. The production method is electrolytic, requiring fewer workers. So aluminum isn't severely bothered by make-work problems.

"We have problems," says a spokesman for one major producer. "But the language in our contract is broader and gives us more latitude to negotiate."

Nickel

The title of the latest report of the House Government Activities Subcommittee, chairmanned by Jack Brooks (D., Tex.), is "Disposal Problems of Government-Owned Nickel Plant at Nicaro, Cuba."

In the first three of 10 findings the report fusses at Freeport Sulphur Co., seller of some ore to Nicaro, for investigating Ira Beynon, a specially appointed General Services Administration agent, since retired. The first three of seven findings suggest action against Freeport for this.

Freeport has some answers. But the important thing is that there is no mention of the fact that GSA talked about incidentals long enough to let the ideal time for the sale pass.

Tin prices for the week: July 15 —102.125; July 16—102.00; July 17 — 102.125; July 20—102.00; July 21—102.00.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	26.80	26.10	8/1/58
Copper (E)	30.00	31.50	7/13/59
Copper (CS)	29.50	29.00	7/16/59
Copper (L)	30.00	31.50	7/13/59
Lead, St. L.	11.80	11.30	5/7/59
Lead, N. Y.	12.00	11.50	5/7/59
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	162-182	185-205	11/3/58
Zinc, E. St. L.	11.00	11.50	2/25/59
Zinc, N. Y.	11.50	12.00	2/25/59

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 110.

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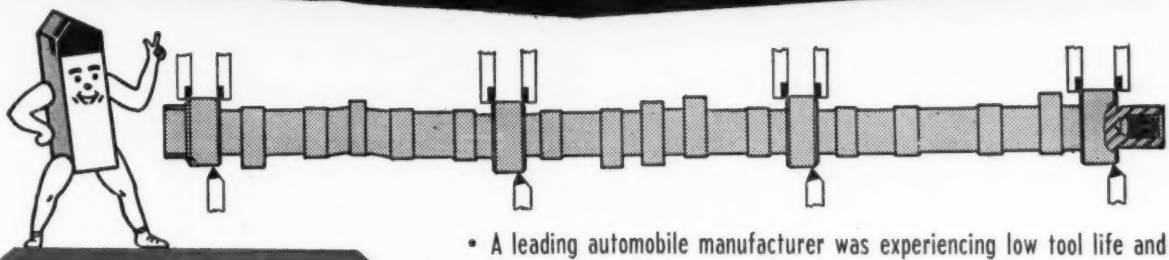
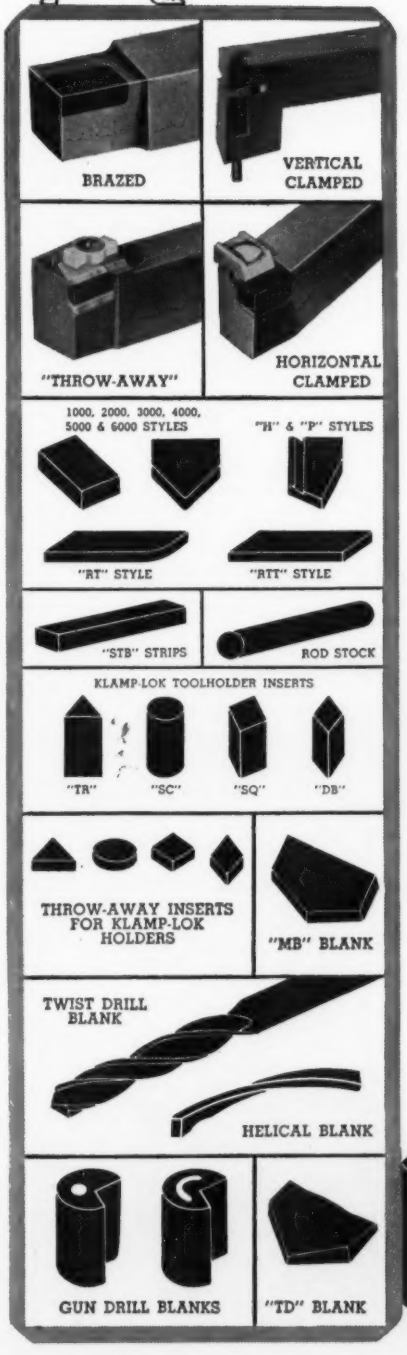




• A leading automobile manufacturer was experiencing low tool life and high costs machining camshafts made of tough, highly abrasive cast iron alloy. Talide tool engineers installed Grade C-91 with the following superior results:

GRADE C-91 CASE HISTORY

Part.....Automobile camshaft

Material....Cast Iron Alloy 1.8165 dia. x 23½" long, 260 Brinell

Operation..Rough turning 4 bearing surfaces

Machine....Sundstrand Model #8 automatic

Tools.....4 Talide TB-123 ⅜" I.C. x 1½" long triangular inserts, Grade C-91, mounted in Klamp-Lok toolholders

Depth of Cut...1/16" to 3/32"

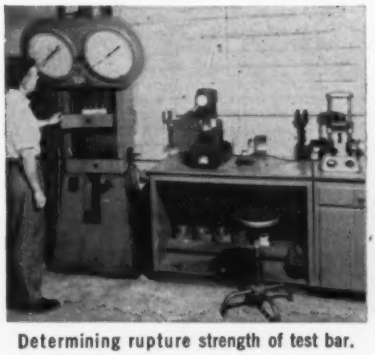
Feed.....012

Speed.....130 (S.F.M.) 274 (R.P.M.)

Coolant.....Soluble Oil

Results....Talide Grade C-91 machined 1020 camshafts per grind compared to 550 for 2nd best competitive grade and 275 for 3rd best. Special attention to the grind and chip breaker detail resulted in Grade C-91 outperforming all other grades used previously.

QUALITY CONTROL GUARANTEES TOP TOOL PERFORMANCE...



Determining rupture strength of test bar. Hardness is determined on Rockwell machine, center.

Leco and Burrell instruments are employed in the analysis of metal oxides.

• A constant research program at Metal Carbides pays off in improved Talide grades having extra high hardness, strength, rupture resistance and crater resistance properties. Processed in latest type vacuum electric furnaces—all Talide grades are uniform and consistent in quality.

Write for Catalog 56-G

METAL CARBIDES CORPORATION
TALIDE®
YOUNGSTOWN 12, OHIO

Metal Carbides Corporation Youngstown 12, Ohio

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	.....	51.36	54.32
Brass, Yellow	47.24	47.78	47.18	50.65
Brass, Low	50.03	50.57	49.97	53.34
Brass, R L	51.02	51.56	50.96	54.33
Brass, Naval	51.90	.....	45.71	55.31
Muntz Metal	49.95	.....	45.26	.....
Comm. Bz.	52.55	53.09	52.49	55.61
Mang. Bz.	55.64	.....	49.30	.....
Phos. Bz. 5%	73.92	.....	74.42	.....

Free Cutting Brass Rod 31.81

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $13.40-$17.00, Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.75-$6.25; alloy, $7.75-$10.00; Bar, HR or forged, commercially pure, $4.25-$5.00; alloy, $4.25-$7.50; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.30
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb.) ... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 33.30 to 42.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $235 to $237
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz... $18 to $20
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.25
- No. 120 ..... 28.00
- No. 123 ..... 27.00

80-10-10 ingot
- No. 305 ..... 33.50
- No. 315 ..... 31.50

88-10-2 ingot
- No. 210 ..... 42.00
- No. 215 ..... 37.75
- No. 245 ..... 33.50

Yellow ingot
- No. 405 ..... 23.75

Manganese bronze
- No. 421 ..... 26.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 25.00-25.25
- 0.60 copper max. 24.75-25.00

Piston alloys (No. 122 type).. 26.75-27.75
No. 12 alum. (No. 2 grade)... 23.50-24.00
108 alloy 24.00-24.50
195 alloy 26.50-27.50
13 alloy (0.60 copper max.)... 24.75-25.00
AXS-679 (1 pct zinc) 23.75-24.75

(Effective July 20, 1959)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 24.00-25.00
Grade 2—92-95% 22.75-23.75
Grade 3—90-92% 21.75-22.75
Grade 4—85-90% 21.25-22.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¼
Yellow brass	19⅝	17¾
Red brass	22⅞	22⅛
Comm. bronze	23⅞	23⅛
Mang. bronze	18⅝	17½
Free cutting rod ends.	18¾	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25¼
No. 2 copper wire	23¾
Light copper	21½
*Refinery brass	23¼
Copper bearing material	22¼

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25¼
No. 2 copper wire	23¾
Light copper	21½
No. 1 composition	20
No. 1 comp. turnings	19½
Hvy. yellow brass solids	14½
Brass pipe	15½
Radiators	16

Aluminum

Mixed old cast.	14 —15
Mixed new clips	16 —17
Mixed turnings, dry	14½—15½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	23 —23½
No. 2 copper wire	21 —21½
Light copper	19 —19½
Auto radiators (unsweated)	13¼—13¾
No. 1 composition	17½—18
No. 1 composition turnings	16 —16½
Cocks and faucets	13½—14
Clean heavy yellow brass	12 —12¼
Brass pipe	13½—14
New soft brass clippings	14 —14½
No. 1 brass rod turnings	11¼—11¾

Aluminum

Alum. pistons and struts	7½— 8
Aluminum crankcase	11¼—11¾
1100 (2s) aluminum clippings	15 —15½
Old sheet and utensils	11¼—11¾
Borings and turnings	7 — 7½
Industrial castings	11¼—11¾
2020 (24S) clippings	12½—13

Zinc

New zinc clippings	4¾— 5¼
Old zinc	3¼— 3½
Zinc routings	2 — 2¼
Old die cast scrap	1¾— 2

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	37-40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	30-32
Clean Monel turnings	30-32
Old sheet Monel	26-28
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

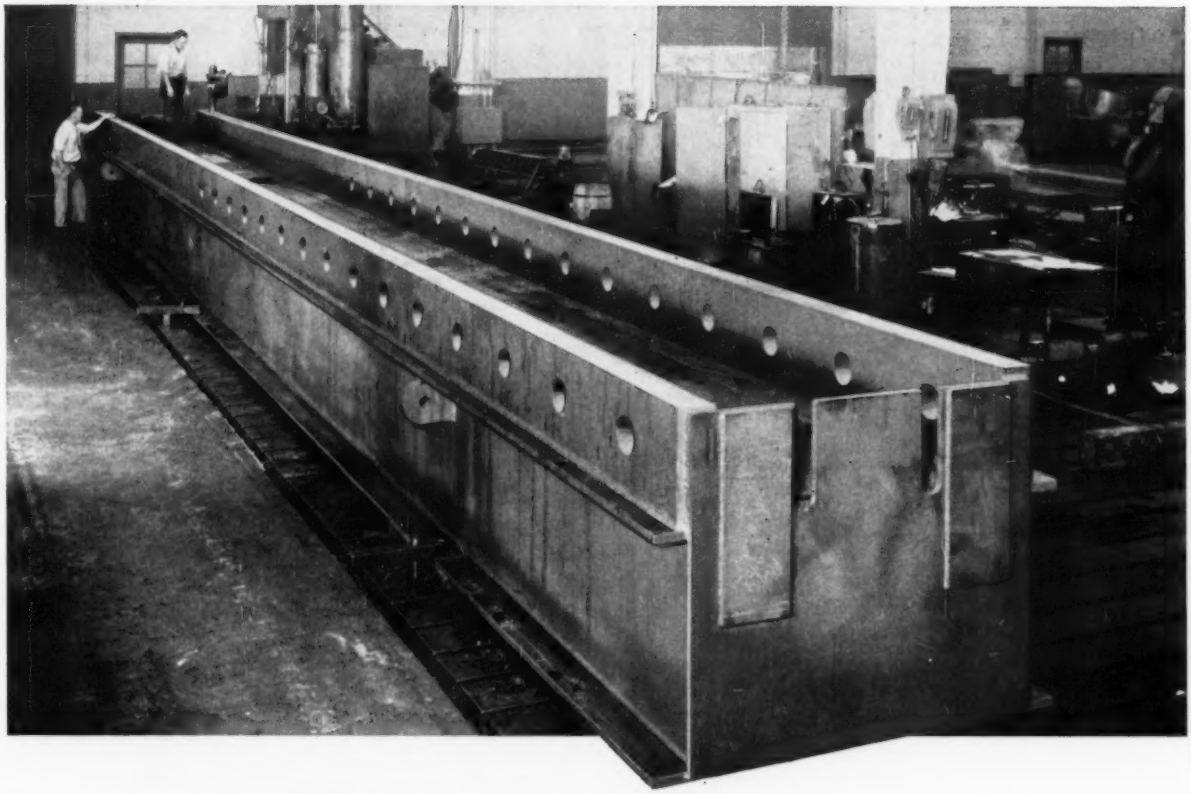
Lead

Soft scrap lead	7 — 7¼
Battery plates (dry)	2 — 2¼
Batteries, acid free	1⅞— 2⅛

Miscellaneous

Block tin	77 —78
No. 1 pewter	59 —60
Auto babbitt	40 —41
Mixer common babbitt	9½—10
Solder joints	13¼—13¾
Siphon tops	42
Small foundry type	9½—10
Monotype	9½—10
Lino. and stereotype	8½— 9
Electrotype	7 — 7½
Hand picked type shells	5¼— 5¾
Lino. and stereo. dross	2¼— 2¾
Electro dross	2¼— 2¾

STEEL-WELD FABRICATION . . .



PRECISION WELDMENTS

Fabricated and Machined to Specification!

The 54-Ton Weldment above, which is 58'-8" long, is the base of a Stretcher-Leveler Machine for use in the production of aluminum sheets. This unusual weldment is one of thousands of Steel-Weld Fabricated parts and assemblies produced by Mahon for manufacturers of processing machinery, machine tools, and other types of heavy mechanical equipment.

When your design calls for weldments of any kind, you, too, will want to discuss your requirements with Mahon engineers; because, in the Mahon Company you will find a unique source for weldments or welded steel in any form . . . a fully responsible source with a long and enviable performance record, and unusual facilities for design engineering, fabricating, machining and assembling.

See Sweet's Product Design File for information on Facilities, or have a Mahon sales engineer call at your convenience.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Use WELDED STEEL for 100% Predictability and Greater Strength with Reduced Weight!

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When Performance Is Critical...

Make Parts Like These From UDDEHOLM Spring Steel

Flapper valves are no better than the spring steel they're made of. And for these critical parts only the finest spring steel is good enough. That's why so many of them are made from Uddeholm tempered spring steel. A flapper valve must function flawlessly for years—the performance of the entire compressor depends on it. Manufacturers long ago found that Uddeholm's fine Swedish Spring Steel met these needs perfectly, *without fail*. It still does.

For your products The same dependable quality of Uddeholm spring steel can insure the performance of your product.

From Warehouse Stocks...

Uddeholm spring steels are available in a wide variety of grades, sizes, tolerances and finishes. Widths run from ⅛" to 16¼"; thicknesses from .001" to .125". If you'd like assistance, or just information, call your Uddeholm spring steel representative today.

Uddeholm Spring Steel Quality Guarantees You...

- Maximum Fatigue Strength
- Uniform Hardness
- Accurate Dimensions
- Fine Micro Finish
- Excellent Wear Resistance

UDDEHOLM SPRING STEELS

Annealed Clock Spring Steel
Camera Shutter Blade Steel
Doctor Blade Steel
Knife Steels
Razor Blade Steel
Reed Steel
Rule Steel
Saw Steels
Tape Steels
Tempered Spring Steels
Tempered Clicker Die Steel
Textile Steels
Thickness Gauge Steels
Trowel Steels
Valve Steels

Write For Our New Spring Steel Stock List

UHB
TOOL AND DIE STEELS
COLD ROLLED SPRING STEELS

UDDEHOLM COMPANY OF AMERICA, INC.

155 East 44th Street, New York 17, N. Y. • MUrray Hill 7-4575

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Los Angeles: 5037 Telegraph Road, ANgelus 2-5121 **DISTRICT REPRESENTATIVES: Chicago:** Frank J. Mackin, Leroy E. Marshall, 55 East Washington, STate 2-1649
Detroit: Warren H. Nugent, 17304 Lahser Road, KEnwood 5-6340 **Philadelphia:** Frank T. Campagna, 1418 Walnut St., PEnnypacker 5-2114
Pittsburgh: Lohmeyer Steel Co., 345 Mount Lebanon Blvd., LOcust 3-0122
TOOL STEEL WAREHOUSE DISTRIBUTORS: Rockford, Ill.: Rockford Industrial Steel Service, 2229 Twenty-Third Ave. WOodland 3-5463

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*			•							
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

(Effective July 20, 1959)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A1*	6.275 *A1*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3,Y1*	6.275 *U1, I3,Y1*	6.875 *U1, I3*	6.775 *U1, I3,Y1*	7.225 *U1*	7.525 *U1, Y1,I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1,Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*	6.875 *G2*							$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3,P6*	6.275 *U1, J3,P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3,P6*	$10.40 *W5, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5; W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets.

(Effective July 20, 1959)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				8.675 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective July 20, 1959) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B.. Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — **Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.

(Effective July 20, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 43.15; 1 side, 36.20.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	15.35
Cleveland *R3*	.....	.....	.....	10.10	.....	.....
So. Chicago *R3*	.....	.....	.....	.....	.....	.....
Ensley *T2*	5.75	6.725	.....	10.10	6.875	.....
Fairfield *T2*	.....	6.725	.....	.....	6.875	.....
Gary *U1*	5.75	.....	.....	.....	.....	.....
Huntington, *C16*	.....	6.725	.....	10.10	.....	.....
Ind. Harbor *I3*	.....	.....	.....	.....	.....	.....
Johnstown *B3*	.....	6.725	.....	10.10	.....	15.35
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *P5*	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	34.35
Erie, Pa., f.o.b.	32.00
Cleveland, del'd	34.19
Cincinnati, del'd	32.84
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective July 20, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3****	173	190	...	...	190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***	177	190	172	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	17.	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.60	10.15
Rankin, Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	.....	236	9.95	10.50†
SparrowsPt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12,90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12,90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
National Tube	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine ½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1¼" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

C. P. Hex, reg. & hvy.	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	41

Semi-finished Hex Nuts	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished	
⅞ in. and smaller	65

Rivets	*Base per 100 lb*
½ in. and larger	$12.85
	Pct. Off List
7/16 in. and smaller	15

Cap Screws *Discount (Packages)*

Full Finished H. C. Heat Treat

New std. hex head, packaged	Full Case
⅝" diam. and smaller x 6" and shorter	54
¾", ⅞", and 1" diam. x 6" and shorter	38
⅝" diam. and smaller x longer than 6"	..
¾", ⅞", and 1" diam. x longer than 6"	..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Plain Finish		
Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl.	25,000-and over 60	..
5/16 to ½" diam. incl.	15,000-200,000 60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk ⅜" diam. & smaller	25,000-and over 15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	46.00
Electrodeposited	38.00
Brass, 80-20, ball anodes, 2000 lb or more	51.50
Zinc, ball anodes, 2000 lb lots	18.00
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.20
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 24.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

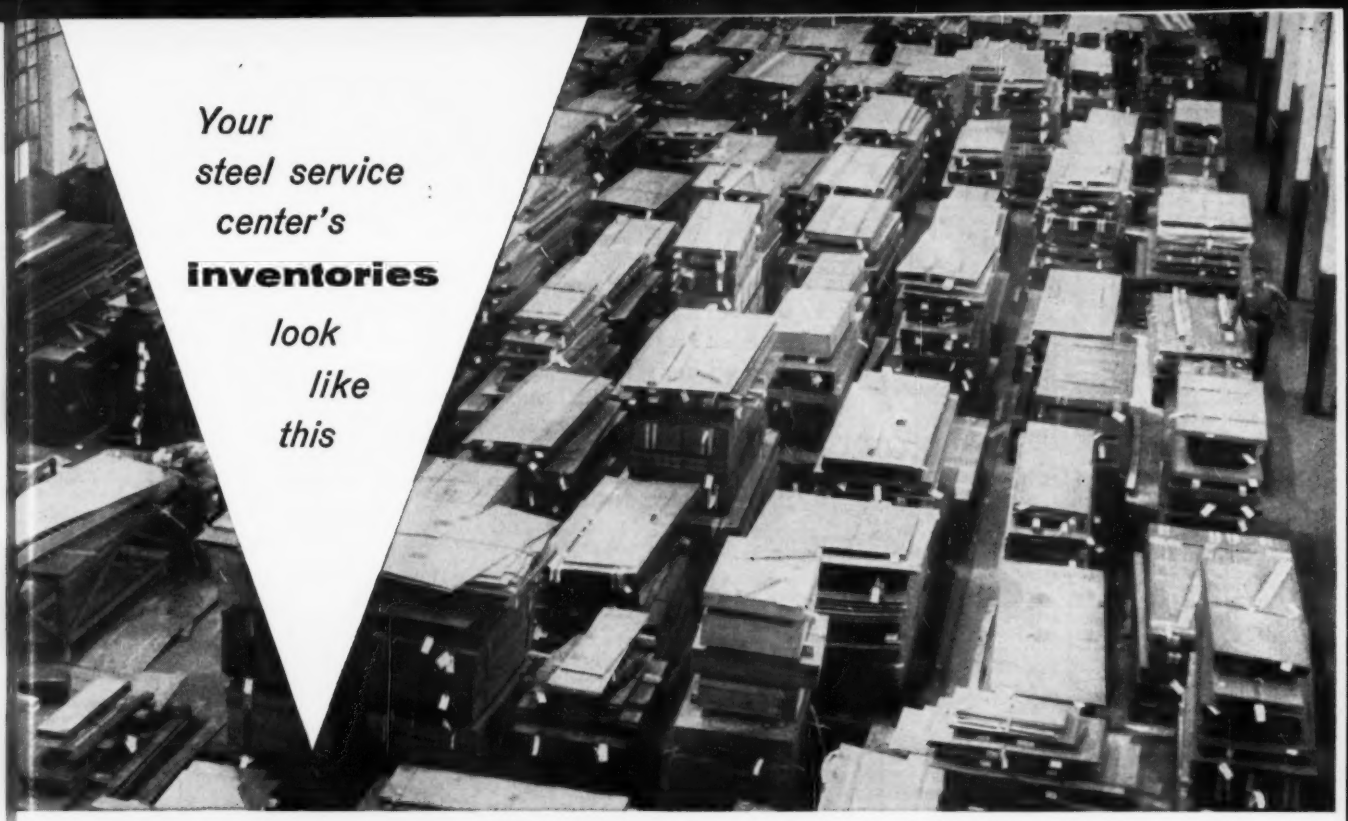
Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*	.....	.....	.....	.....
Baltimore	$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99	.....	.....	.....	.....	.....
Boston**	.10	10.52	11.27	11.82	12.17	10.42	10.72	10.34	13.45*	16.79	16.69	20.29	21.04
Buffalo**	.15	9.80	10.50	11.35	11.30	10.25	10.40	9.90	11.60*	16.34	16.45	19.01	20.80
Chicago**	.15	8.69	10.35	11.05	10.35	8.62	9.16	8.79	10.80	16.20	16.10	19.70	20.45
Cincinnati**	.15	8.86	10.41	11.10	10.67	9.00	9.84	9.11	11.68*	16.52	16.42	20.02	20.77
Cleveland**	.15	8.62[1]	9.61	11.02	10.36	8.76	9.63	9.36	11.40*	16.31	16.21	19.81	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	8.95	10.61	11.40	10.72	8.99	9.84	9.10	11.16	15.46	16.38	18.81	21.03
Houston		8.10	8.60	.....	8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles**		9.95[1]	11.55	12.20	11.55	10.00	10.00	9.10	14.20	17.30	16.45	21.30	20.80
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee**	.15	8.83	10.49	11.19	10.49	8.76	9.30	8.93	11.04	16.34	15.34	19.84	19.09
New York**	.10	10.52	10.59	11.40	12.14	10.77	10.84	10.09	13.35*	16.16	16.50	20.10	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia**	.10	9.55	10.10	10.71	11.75	10.15	10.20	9.50	12.05*	16.58	16.48	20.08	20.83
Pittsburgh**	.15	8.62	9.61	10.95	10.36	8.52	9.24	8.62	11.40*	16.20	16.10	19.70	20.45
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30*	18.50	17.45	20.75	20.25
San Francisco**	.10	11.00	11.95[2]	11.50	12.25	11.00	10.95	10.75	15.20	17.05	16.35	21.05	20.60
Seattle**		11.55	12.30	12.50	12.65	11.00	10.20	11.10	16.20	17.15	17.80	20.65	22.20
Spokane**	.15	11.70	12.45	12.65	13.30	11.15	11.35	11.75	16.35	17.75	17.95	21.55	22.35
St. Louis**	.15	9.07	10.73	11.02	10.73	9.00	9.76	9.17	11.43	16.58	16.48	20.08	19.33
St. Paul	.15	8.94	9.31	10.47	8.99	9.45	9.53	9.70	11.49	.....	15.41	.....	20.83

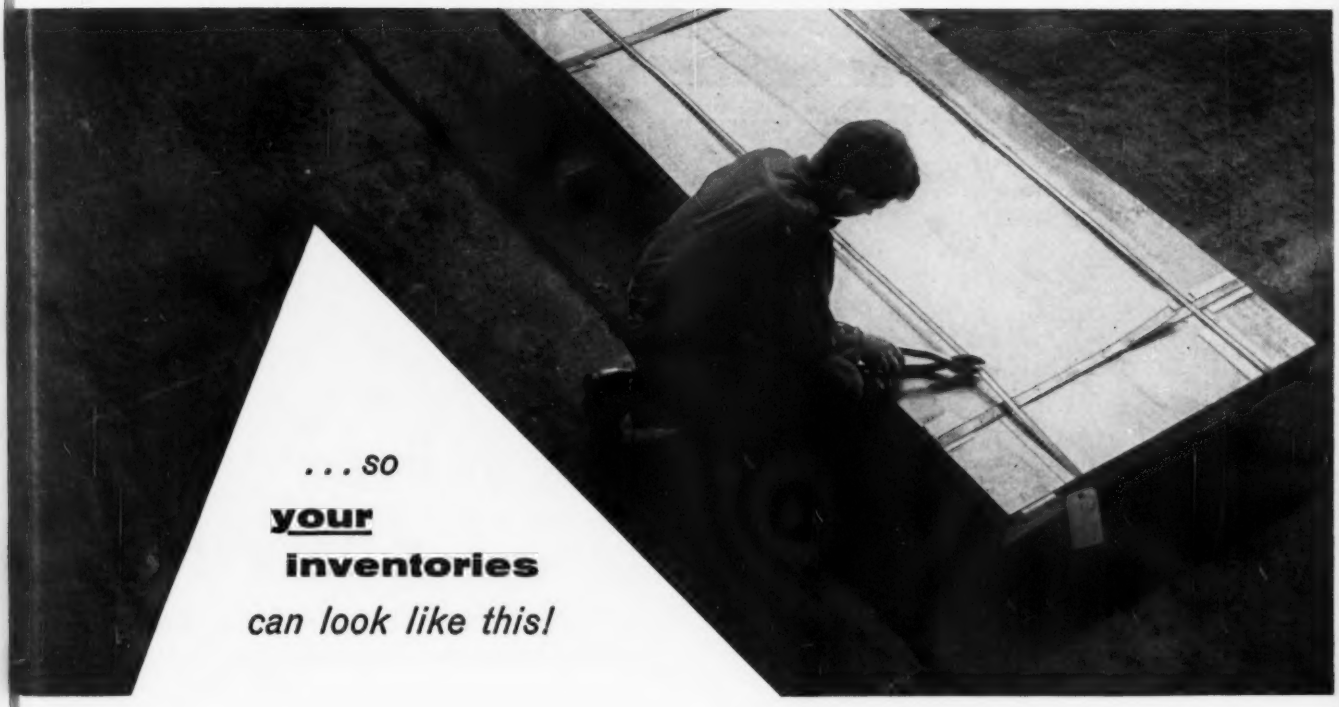
Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; * C 1018—1" rounds.

†† 10¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter.

(Effective July 20, 1959)



Photos courtesy of The Universal Steel Company



To cut inventory costs, make your Youngstown Warehouser your local "steel service center". Make full use of his complete local stocks, fast delivery service. His one-source service simplifies your purchasing and bookkeeping, too. You'll find him an efficient, time-saving, partner-in-production.

AMERICAN STEEL WAREHOUSE ASS'N

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Beasemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A5;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3,* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

(Effective July 20, 1959)

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Measure sales performance
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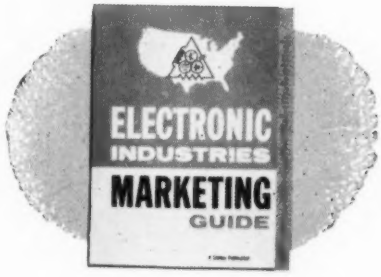

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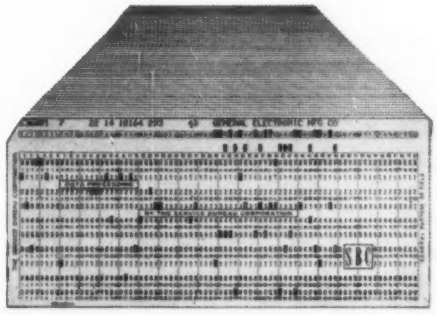

Company Name
Type of Plant
Number of Employees

Number of Electronic Engineers
Major Products
Minor Products

State, County, City
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ELECTRONIC INDUSTRIES

Chilton Company Executive Offices:
56th & Chestnut Sts., Phila. 39, Pa.
SHerwood 8-2000

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 37.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 28.25
0.025% C (Simplex) 39.75
8% max C, 50-55% Cr, 6% max Si. 25.75
4½% max C, 50-55% Cr, 2% max Si 26.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.)
Carloads, delivered, lump, 3-in. x down, packed.
Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	28.25	14.60
Ton lots	33.50	16.05
Less ton lots	35.10	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Ca, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 14.80
Ton lots packed in bags 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.
Carloads bulk 12.80
Ton lots, packed 14.45
Carloads, bulk, delivered, per lb of briquet 15.10
Briquets, packed pallets, 2000 lb up to carloads 17.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe..	22.45	21.25
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective July 20, 1959)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound

Ton lots $3.45
Less ton lots..... 3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy

35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over

No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed) $1.46
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This late model emission-type spectrograph can give direct dial readings on as many as 20 different chemical elements in testing the composition of a special steel alloy.

Latest laboratory equipment speeds quality control at Standard

Installed in the Metallurgical Laboratory at Standard Steel Works are the latest scientific testing instruments for the most accurate and rapid testing of steels in all stages of production. Samples are delivered by pneumatic tube from melting furnace to laboratory in 90 seconds. Using the spectrograph pictured above, analyses can be determined in 1½ minutes, saving hours of time over older methods.

Standard's recently installed electric furnace and vacuum degassing equipment assure delivery on special alloy products in the shortest possible time. Standard's quality control procedure guarantees that your most exacting requirements will be met. Write Dept. I-G for details.

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New Market for Used Machinery Sales

Dealers may find training schools for plant employees a good source of orders.

Manufacturers buy the equipment to train workers while new plants are being built.

▪ Training schools for plant employees can be a good market for used machinery sellers.

When new plants go up, production men generally have their core of experienced men brought in from elsewhere. Local skilled men are generally available or the shop wouldn't be there. But they are still unfamiliar with the specialized methods, standards, or other manufacturing practices.

Speeds Startup—This is where used machinery can be brought into use to train men before the actual plant is completed. That way production can be started sooner and probably more quickly when the new or expanded plant is complete.

Then the machinery can be kept for training or experimental purposes or even as a production standby. The used machinery is entirely adequate although far less costly than investment in new machinery.

All in One Place—Many different types of equipment can also be gathered in one place instead of sending men to factory training schools run by manufacturers. Also more modern types of machines can be far more useful than relics which shop people are glad to be rid of.

Two companies which have put used machinery in schools such as this in recent years are a new electrical appliance maker and an aircraft plant in Columbus, O., according to Harry L. Ayres, a used machinery broker there.

Columbus Market Slow — The Columbus market for used machinery is comparatively slow and mostly concentrated in general machine shop lines. Because of the diversity of manufacturing, units like lathes, milling machines, grinders, drill presses, band saws, and similar equipment constitute the bulk of the business. Columbus draws on the nearby machine tool capital of Cincinnati and Detroit for most units. Others occasionally come from large local firms which make auto parts, mining equipment, heavy presses and bearings.

"They'll all tell you how to get on my good side, but don't pay any attention. I have no good side."

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5 ton P&H	40' Span 220 Volt D.C.
10 ton P&H	55' Span 230/3/60
10 ton P&H	39' Span 230 Volt D.C.
10 ton Milwaukee	57' Span 230 Volt D.C.
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Whiting	75' Span 220/3/60 A.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Milwaukee	56' Span 440/3/60 A.C.
5 ton Aux.	Arr. for Magnet Opr.
30 ton Shaw	70' Span 230 Volt D.C.
120 ton Niles	67' Span 230 Volt D.C.
120 ton Shepard Niles	77' Span 220/3/60 A.C.

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7,000 lb. Draw Bench, 51 ft. Draw
10,000 lb. DrawBench, 50 ft. Draw
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1	800	Whse.	CW	550	1776
1	700	A.C.		2300	500
1	600	Whse.	CW-4-32D-15	440	1778
1	500	G.E.	MT-412	2200	439
1	500	Whse.	CW	550	350
1	300	G.E.	MTP-561	2200	1800
1	200	G.E.	1M	440/2200	589
1	125	G.E. unused	MT-557	220/440	1200
1	100	G.E.	MT-564	440/220	450
1	250	G.E.	IM-16	220/440	875
1	250	A.C.	ANY	550	600
1	250	Whse.	CW	2200	450
1	250	Cr.Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	IE-13B	220	1800
2	200	Whse.	CW-890	2300	1775
1	200	Cr.Wh.	SR-26QB	440	505
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3	100	A.C.		440	695

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4	500	Whse.	CS-1216	2200	500
2	450	Ell.	F-3910	2200	1200
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1	1750	G.E.	TS	2300/4600	900
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College degree preferred for these positions.

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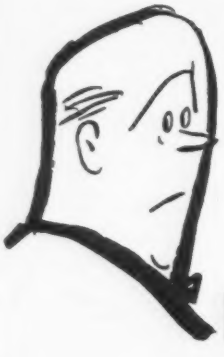

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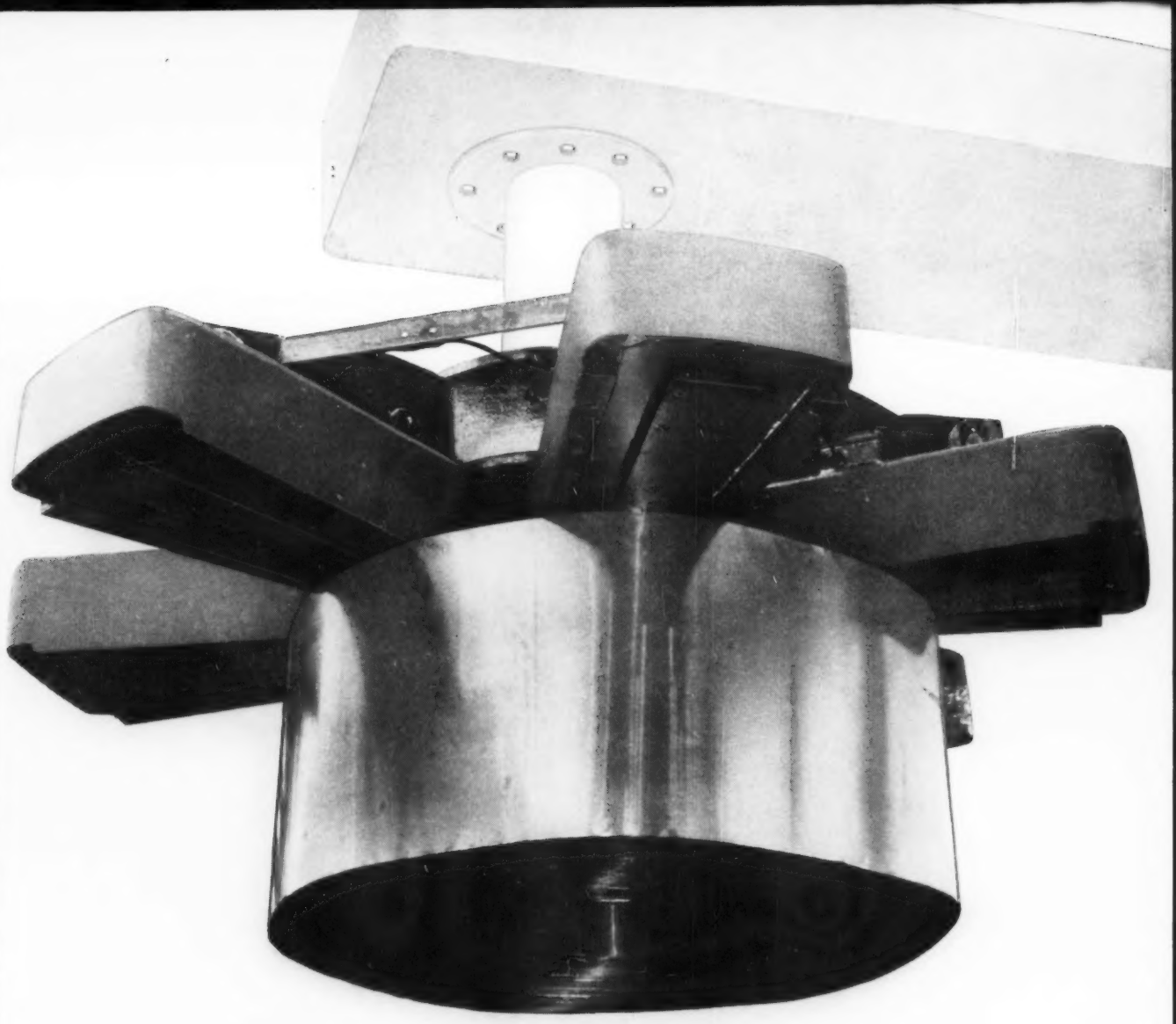

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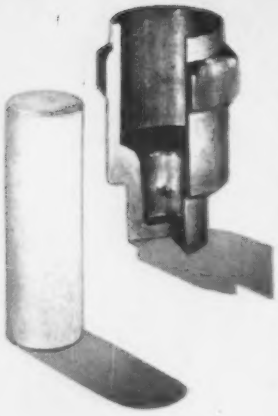
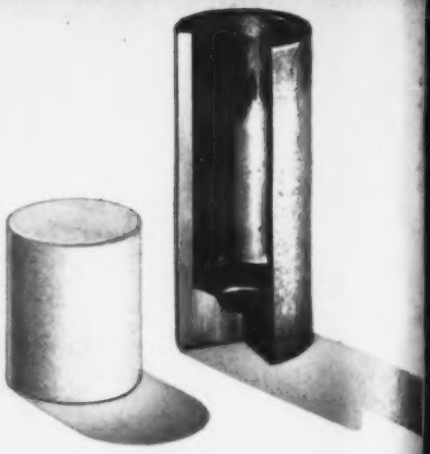


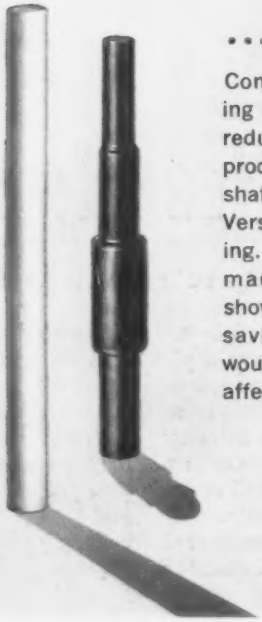
...By 95%?

Production of automotive sparkplug shells by Verson Impact Machining from the slug shown reduces conventional machining requirements by 95%. 65% less material is required and a less costly grade can be used. How would savings like these affect your profits?

...By 85%?

When this automotive valve tappet body is produced by Verson Impact Machining from the slug shown, conventional machining requirements are reduced by 85%. 57% less metal is required as well. How would savings like these affect your profits?



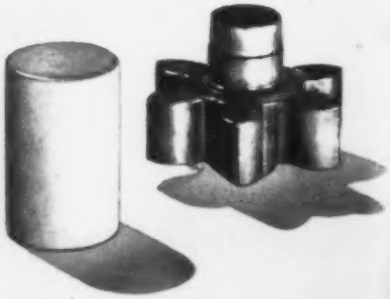


...By 85%?

Conventional machining requirements were reduced by 85% when production of this worm shaft was converted to Verson Impact Machining. The shaft is now made from the slug shown with a materials saving of 70%. How would savings like these affect your profits?

...By 98%?

Rotor gears are Impact Machined from the slug shown to reduce conventional machining requirements by 98%. Material consumption is cut 75%. How would savings like these affect your profits?



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